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ELEMENTARY HYGIENE FOR THE TROPICS

AZEL AMES M.D.

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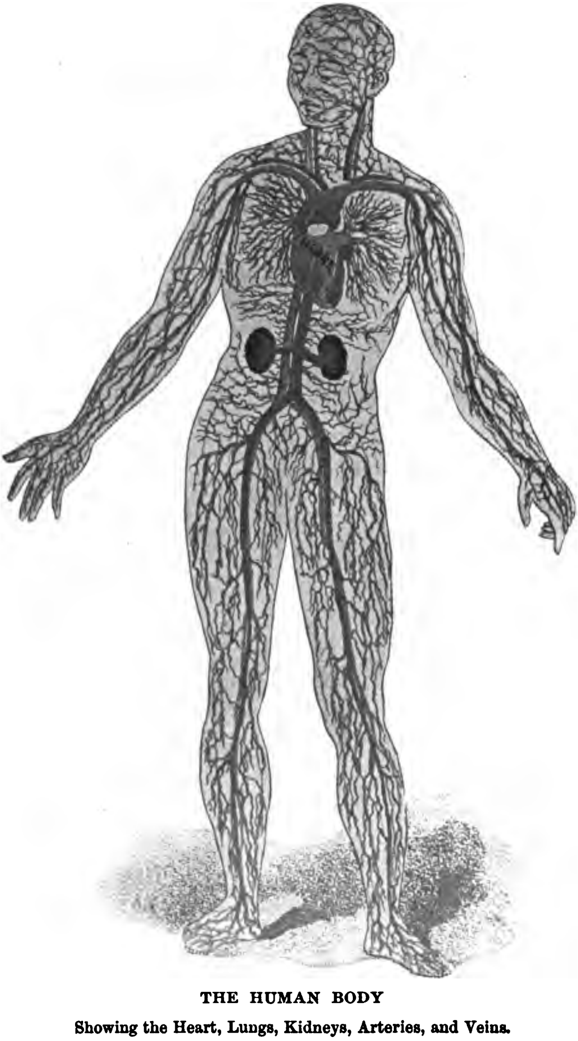

THE HUMAN BODY

Showing the Heart, Lungs, Kidneys, Arteries, and Veins.

ELEMENTARY HYGIENE FOR THE TROPICS

BY

AZEL AMES, M.D. (HARV. 1871)

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BOSTON, U. S. A.
D. C. HEATH & CO., PUBLISHERS
1903

Educ T 377.02.140

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INTRODUCTORY

The bad effects of sickness

Every one wishes to be well, because the sick cannot work or find pleasure. They often suffer pain, are burdens to their friends, and are no comfort to themselves. They enjoy nothing, their lives are in danger, and many die. If a man is too ill to work he cannot earn anything for himself or his family, and he and they are often poor, hungry, and wretched.

To be well is to be able to earn, and to have the things one needs, such as food, clothing, and home comforts, — to be able to go about as one likes; to be free from pain and distress, and to enjoy life.

It is important to keep well

Then it is certainly worth while *to keep well.* If one has sound health he can have almost everything else. He can earn money, learn something, do more work, thrive better, and enjoy his life more. With good health one is more likely to be prosperous, contented, and happy, and to be just and kind. In fact, one is likely to be a happier man or woman, neighbor or citizen, — a better and happier boy or girl.

Health then is, on every account, the first thing for every person to get and to keep.

Every one should care for his health

The care of health must begin with each person, and at home. The first and greatest dangers to health are found in the home,—where it should have the first and best protection. Every person should know and do what is best for health, and every home should be healthful.

Many are sick who should be well

Many more people are sick, and there are many more deaths every year, than there should be, or than there would be if the simplest laws of health were obeyed.

Sickness and death bring suffering and the loss of friends. These are heavy burdens for even well people to bear. As each person when well can usually earn something, the loss to a family, and to a community, of all the earnings of those who are sick, is very great.

The purpose of this little book is to help to teach the young how to be well, so that they may have the good things that health brings.

It is called a book on *Elementary Hygiene for the Tropics,* because the study of all that promotes health is called hygiene, and this word has come to be but another word for health. The putting together of some of the first and simplest facts and rules for healthy living is called elementary hygiene, because these facts, rules, etc., are its elements or beginnings, — the first things one must know to live rightly and keep well. As in hot climates there are many things which cause sickness that are not found in colder countries, the first or elementary things of hygiene in the tropics call for such special thought and study as are given in these pages.

This book tells the first things one must know in order to keep well

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ELEMENTARY HYGIENE FOR THE TROPICS

CHAPTER I

THE "MUSTS"

We all must learn

YOUNG people cannot at once learn everything. It would be well if all knew about their bodies and their needs; how each part is built, how each works, and what it does. It would be well if all knew how the air we breathe, the food we eat, and what we drink, are made; what they do for us, and how they do it; and what effects our habits, homes, etc., have upon our health. Some of these things can be learned only slowly and by long study.

"Musts and Must Nots"

But there are some things that we *must* know. There are some wants of our body that we *must* understand and promptly supply. There are some of their laws that we *must* obey quickly, or we shall suffer, become ill and wretched, and soon die. These needs and laws are all the time saying to us, "You must!" or "You must not!"

They mean what they say, and the real beginnings of hygiene are in finding out what these "musts" and "must nots" are, and how to meet and obey them. Let us see what some of the first of these "musts" are.

The breath and the blood

The first thing a child must do when it is born is *to breathe,*—that is, to fill the proper parts (the *lungs*) with air, and to throw it out again. Why? Chiefly because the lungs must be kept supplied with that part of the air that is called *oxygen,* and pass it on into the blood. When the blood comes to the lungs through the little tubes, or blood-vessels (called *arteries* and *veins*) from all over the body, it is very dark in color because of the impurities in it. The oxygen of the air in the lungs helps to make the blood pure again, and it goes on its way to the wonderful little pump (the *heart*) which sends it out again fresh and red.

What the air does

The air which has been made foul by the bad things it took from the blood in the lungs, is thrown out, and fresh air is again taken in. If the air did not in this way purify the blood, the blood would soon become black and poisonous and kill us. If the air did not carry moisture to the mouth and air-passages, we could not speak, whistle, or sing.

At the same time that the child breathes, it must have the *blood flowing* (pumped by the heart) through the blood-vessels to all parts of the body. Why? Because the blood (aided by the little threads called *nerves*, which run everywhere) carries life, heat, and strength to all parts. It mends those that have been hurt or worn out, and gives power to every part to do its work.

THE SENSES

The child must *eat and drink*. Why? Because its food and drink are changed into the blood which makes the new flesh and bone, repairs the hurts and waste and gives energy and warmth to the body.

The child must have *clothing*. Why? Because its vital parts, which may easily be chilled,

— and so its life be put in danger, — must be covered, so that the warmth of the body may be kept in, and the cold and dampness be kept out.

Sleep and rest

The child must *sleep*. Why? Because all living things are so made that they must sometimes have rest, which in human beings and the lower animals comes best through sleep. We do not understand sleep, but all enjoy it. Indeed, without it we should suffer badly, soon become crazed, and die.

The waste of the body

The child must *get rid of the waste* of its body. Why? Because if this waste is not thrown out of the body it clogs and poisons, and will soon destroy health and life.

All these things, and some others, must be kept up without stopping. Some of them — like breathing and the flow of blood — go on without change or rest, from birth to death.

The senses

To do all these things *in the best way, and with the best results*, every one must have the use of what are called the senses; that is, must be able to see, hear, feel, taste, and smell.

It is clear from what we have seen, that to live, and to have health and all that comes with it, one must have: —

First: The right kind and quantity of the life supplies; such as air to breathe, food to eat, and clothing to wear; sleep, exercise, etc., — and

Second: All the parts of the body in good condition to do their work.

The two things essential to life and health

The lungs — the parts with which we breathe — must be in good order to take in the fresh air, and to throw out the bad. The stomach and the bowels (into which the food goes to be worked over) and all the parts that give the different juices which help the changes, must work together to make the food into blood.

The wonderfully arranged parts of the body which we call the *brain* and *nerves*, through which we think and act, must be in a healthy state. The skin, which covers the body, throws off many impurities, and must work freely. The bowels or intestines pass much of the solid and part of the fluid waste out of the body. The kidneys and bladder do the same for the fluid waste not thrown off in other ways. All must work well, each doing its part.

THE WORKS OF A WATCH

The body is like a fine piece of machinery

The body is, in fact, a fine piece of machinery, a beautiful engine; but all its parts, like those of a watch, must be kept in good order, if it is to do its work.

If we disobey any of the laws of hygiene; if we neglect to give to the body the proper supplies that it calls for, or if any part gets hurt or out of order so that it cannot do its work, the whole has to suffer. But if we take care of it as we ought, we shall find that the body, like a well-kept horse, will pay us well for our good treatment. First of all we *must* give it its supplies.

QUESTIONS

1. What is the first thing a child does?
2. Why?
3. What is the second thing the child does?
4. Why does the child need clothing?
5. Why does every one need to sleep?
6. What happens if the waste of the body is not got rid of?
7. What are the five senses?
8. What are the "life supplies" that we must have?
9. With what parts of the body do we breathe?
10. Where does our food go to be worked over into blood?
11. What helps this work?
12. What do our brains and nerves do?

CHAPTER II

AIR

We must have enough pure air

THE first supply that we must give the body is *air*. The first thing that each of us did was to breathe it, and it will be the last thing each of us will do. We could not live a minute without it, though one may live for days without food or water. It is all about us all our lives, though we cannot see it. It is one of our best and most useful friends, but may become one of our worst and most dangerous foes. *It must be had in plenty, and it must be pure.*

What air is

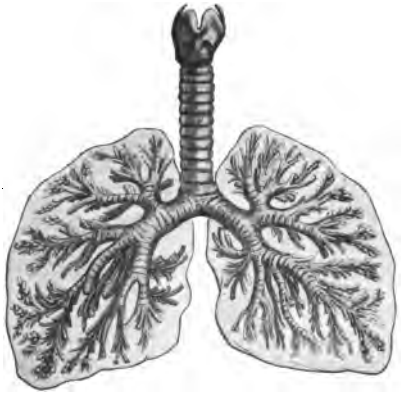
When air is pure it is made up of about one-fifth part of the gas we call *oxygen*, about four times as much of a gas called *nitrogen* (the full uses of which we do not yet understand), a very little *carbonic acid gas*, and a little moisture.

Its uses

The first use of air to most living things is for breathing, — for plants and fishes breathe in certain ways as well as boys and girls. If there were not any air there would not be any sound; and there would not be any wind to carry rain-clouds or to scatter seeds, or to do many other important things.

The lungs

Our lungs, with which we breathe, are made up of great masses of what are called *air-cells.* These are like very great bunches of very small grapes, each grape having a skin much thinner than the thinnest paper, and being hollow.



THE LUNGS

How the air reaches the lungs

When the air we breathe goes in through the nose or mouth, it goes down a large tube or pipe, called the windpipe, to the lungs. Here this tube divides into smaller tubes, and these divide again and again into still smaller ones, till by very small tubes indeed the air is carried to each little hollow cell and fills it.

In the very thin skins of all these air-cells, there are very small tubes called capillaries (from the Latin word *capillus*, a hair, because they are like a hair in size). Through these flows the dark, impure blood which has come to them from all over the body, on its way to the heart.

How fresh air makes the blood pure

The fresh air that rushes into these air-cells every time we breathe, passes into these capillaries or little blood-vessels, and the oxygen of the air is taken up by the blood. All the bad matters in the blood are taken out by the oxygen, and the blood is made fit for use again. We must breathe air *in*, to carry oxygen to the blood through the lungs, and we must breathe *out* the foul air to get rid of the impurities.

The quantity of air one breathes and the quantity one needs, are not always the same. As we are constantly breathing, and a person's lungs hold more than five and a half litres — (nearly six quarts), it is easy to see that even when the air is fresh and pure each person must breathe in a great quantity every hour, to satisfy the body's demands.

If the air is not pure

If the air is not pure, and especially if it is loaded with foul gases, smoke, and the like, a

Bad air often makes the head ache

great deal more must be breathed to give enough *oxygen* to do the work. The lungs must labor harder to pass so much more through them, and then there is distress, headache, and in time, illness, because the proper supply of air was cut off and that used was poisoned.

Every time we breathe we take into the lungs something less than half a litre of air, and throw out about the same quantity, though, as we have seen, the lungs hold much more than this. A grown man when he has taken in a full breath *can* throw out about four litres of air, and after he has thrown out all he can, his lungs will still be nearly one-third full. This is so arranged that we may always have some in store for an extra draft upon us, such as comes when we run, climb hills, or exercise very actively in any way.

How much pure air must one have?

It is not easy to tell in any simple way how much pure air each grown person needs every hour, or to know whether the air one is breathing is pure or not. The physicians and chemists agree that each person should have about three thousand (3000) cubic feet of fresh air every hour, but it is not easy, except for those of experience, to know readily when one has it.

If a room is ten feet long, ten feet wide, and ten feet high, it will hold just one thousand cubic

Too many people often stay in small rooms

feet of fresh air. You can see that we must change the whole of the air in that room three times an hour to give each person in it the three thousand (3000) cubic feet needed. If there are enough doors or other openings in the walls, so that all the air can be changed easily, the person would get the three thousand cubic feet, and by changing all the air six times every hour, we could give two persons in that room the quantity of fresh air they ought to have. But we could do this for no more persons, because the air in a

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A CROWDED CLUSTER OF UNHEALTHY HOMES

room cannot be changed more than six times in an hour, without making uncomfortable and dangerous draughts. So we see that in a room of the size named, even if the air were thoroughly changed six times in an hour, there would be the right quantity for only two persons. This shows us that many persons whom we know are living in a crowded and unhealthy way, and that they are taking risks to health and life. People often long endure very bad conditions of air, yet do not for some time become ill. They may not even seem to suffer, but there is a sure poison at work which will not fail to injure health.

Dangerous draughts

Some ways to tell foul air

There are a few signs by which we can tell whether or not one is getting enough fresh air, but none of them are sure guides. They are often tests of the general impurity of the air, rather than of a want of quantity. Foul smells, a sense of tightness about one's lungs, or one's forehead; difficulty in breathing; the failure of lights or the fire to burn well; too great heat, with sleepiness, etc., all show that better air is needed.

Not easy to know what it is in air

Many things get into the air about us that can do great harm if breathed into the lungs, but which cannot be found until after their mischief is done. Some of the little growths (called *germs*, *bacteria*, and *bacilli*), many of which we know come from uncleanly living and surroundings, are carried about in the air, and if taken into the body, surely plant their diseases, such as smallpox and scarlet fever.

Many things pollute the air

There are, in fact, a great many things which pollute the air about us, and so destroy health and endanger our lives. Some of them can be found only by the microscope, some by the chemist, and others are not discovered at all, except by the harm they do. We must learn what they come from, and how they work, and *use every means to prevent and remove their causes.* This is the best way to make sure that the air we breathe is pure.

QUESTIONS.

1. What is the first supply that the body must have?
2. What is the first use of air?
3. What are the air-cells in our lungs like?
4. How does the air get into our lungs?
5. How does the fresh air make the blood pure?
6. How much air do the lungs of an ordinary man hold?
7. Can we tell surely whether the air we breathe is pure or not?
8. What are some of the signs by which we can tell that the air is bad?
9. What can we do to keep the air about us pure?

CHAPTER III

THE IMPURITIES OF AIR

THE sources or causes of impurity in the air we breathe are chiefly of five kinds. They are found almost everywhere, but some of them most in tropical climates. They are: —

The chief kinds of air impurity

1. The foul gases and matters in air which have been breathed, and impurities thrown out by the skin;

2. The smoke, carbonic acid and other bad gases, oily vapors, and little particles of fuel which always get into the air from burning anything. These come alike from fires by which we cook or heat, or those like the smith's, used in the trades; or from the candles, lamps, or gas that we use for lights;

3. The foul odors, gases, and other poisons of rotting animal and vegetable matter. These come from pipes or pits, sewers, drains, and cesspools, in which foul waters (*sewage*) flow or are stored; and the waste (*excreta*) thrown out by the body;

4. The smells, fumes, vapors, dust, and dirt given off from stables and from different trades and manufactures, such as soap-boiling, match-factories, cigar-shops, potteries, etc., — this class being smallest in tropical climates ; — and

5. The several poisons which rise from damp and filthy soil.

The Impurities of Air

Foul gases and matters thrown out by the lungs and skin.
Smoke, gases, and particles of matter made by fires and lights.
Bad odors, gases, and poisons from rotting animal and vegetable matters.
Smells, fumes, and dust from trades and manufactures.
Poisonous vapors from damp and filthy soil.

Air poisons from our bodies

There are hardly any worse impurities than those of air which has been breathed and re-breathed through people's lungs. Such air has taken up and holds all the foul things of the blood. It smells bad and is full of poison.

The skin, too, is all the time giving out in the moisture that we call perspiration, bad odors and foul matter, which is part of the body's waste. The skin itself is often diseased, and it gathers a great deal of dust, dirt, grease, etc., which it throws off into the air we breathe.

When this is true of each person, what must it be when many live and sleep together in small rooms, where very little fresh air can get in, and where at night, when it is most needed, this little is carefully shut out?

A HERD OF CATTLE

No need to suffer from close air in the tropics

We ought not to suffer and die from this kind of air-poison in the tropics, because here one can live so much in the open air. In colder countries the houses and shops must be much more tightly built, and the cold makes people keep their houses

Even colder countries suffer less

shut many months at a time. But we suffer worse than they because we do not try, as they do, to keep the air pure and to have enough of it for each person.

Why the cattle do not die like the people

There are in hot climates many more deaths, and at earlier ages, than elsewhere from *tuberculosis*, the one disease which more than any other comes from moist and rebreathed air. Yet the cattle, which in cold climates die of *tuberculosis* in great numbers, do not die of this disease in the tropics. Why? Because they live all the time, even by night and in wet weather, in the open air, keep clean, and eat and drink rightly.

OXEN PLOWING IN PORTO RICO

Few things cause more sickness and death in the tropics than the bad custom, everywhere so

Crowding into close rooms at night

common, of crowding many persons into small rooms at night, carefully shutting out all the fresh air. Such conditions must soon, and surely, bring disease, while the "night air," which is so much feared, has no such power for harm as is thought, and any that it may have we can largely overcome.

QUESTIONS.

1. What makes the air that we have breathed impure?
2. How does a dirty skin make the air about it bad?
3. Why should people who live in warm climates have less trouble with these kinds of bad air than the people who live where it is cold?
4. Why do people who live in warm climates really suffer more from these air poisons?
5. Why do the people in warm countries die of *tuberculosis* when the cattle do not?
6. What causes more sickness and death in hot climates than anything else?
7. Is there any danger in breathing night air?

PLOWING IN THE PHILIPPINES

CHAPTER IV

THE IMPURITIES OF AIR (*continued*).

Air impurities from fires, lights, etc.

WHERE anything is burning, smoke and gases escape into the air. If these are in our houses, we must breathe them. Candle, lamp, and wood smoke badly irritate and bring disease to the eyes, throat, and lungs. Charcoal, a common fuel in hot climates, if burned without plenty of air, quickly gives off fumes which poison the blood and are very deadly. In tropical countries, where it is usual to have open wood or charcoal fires in the houses,—there being often no chimney but a hole in the roof,—smoke and gas often fill the house. As in wet weather the heavy fumes of charcoal will not rise, the damp air becomes unfit and unsafe to breathe. Persons lying beside charcoal fires in damp weather have often been stupefied, and charcoal-burners who have gone to sleep beside their pits in the mountains have been found dead, being killed by the poisonous gases. No more deadly and subtle poisons enter the air of our homes than come from the fires and lights that we use in them.

Danger from charcoal fires

Air impurities from decaying matter

The rotting (decaying) of animal and vegetable matter is a great cause of impure air and of disease. Rich vegetation, the neglect of refuse of all kinds, the heat of the sun, and great moisture, unite to cause putrid decay everywhere.

John Simon, a very able English health officer, thought that the greatest danger to health was the failure properly to remove refuse matters from about the homes of the people. There is no doubt that he was right. Some things bring danger without stench to the air we breathe. But decaying matter of all kinds, and all refuse that is the waste of men or of animals annoy us with their offensive odors,—which of themselves bring sickness. Each makes and gives to the air its own poison and plants its own seeds of disease. Yet these bad smells are sometimes useful, for they warn us of danger and tell us where it lies hidden.

Air impurities from trades, etc.

There are so few trades or manufactures in hot climates that the people are comparatively free from most annoyances and dangers from this source. Yet there are some trades in which the workers — often women and children — must breathe air made impure and unsafe by the work done. Those who make matches often suffer horribly from the poisonous fumes.

All smiths and metal-workers breathe the foul gases of their furnaces and forges and the particles of dust and metal which fill the air of the shops.

Unhealthful trades

Cigar-makers, tanners, soap-boilers, and others must breathe the heavy, damp, and sickening odors, and small bits of the tobacco, hides, etc., that they work upon. Bakers, potters, stone-cutters, wood and metal turners, etc., breathe more or less of the dust of their trades, and this dust injures health. But the numbers who suffer, and the diseases which come from the impurities in air from trades and manufactures in the

CIGAR-MAKERS AT WORK

Air impurities from damp and filthy soil

tropics, are trifling as compared with those of the manufacturing countries.

Many bad odors, foul vapors, and probably the germs of disease arise from damp and filthy soil to poison the air. They are most and worst in hot countries. We do not know them all and we do not know how some of them do their work, but we know that anything that enters the air from dampness and filth carries danger and disease with it. For health we must have dry, clear air and dry, clean soil. Many of the diseases of tropical climates — throat, lung, and bowel troubles, agues, fevers, etc. — come from living upon damp and filthy land and from breathing the air that is made foul by it.

Impure air and damp, filthy soil are sources of disease

QUESTIONS

1. How do the fires and lights in our houses make the air impure?
2. What is the chief cause of bad air and disease in warm countries?
3. How are the bad smells of filthy things sometimes useful?
4. What are some of the trades or occupations that make the air bad for breathing?
5. How are the makers of matches affected by their work?
6. What kinds of work make unwholesome dust particles for the workmen to take into their lungs?
7. What are some of the bad effects of damp and filthy soil?

CHAPTER V

HOW TO HAVE ENOUGH PURE AIR

The work of hygiene to prevent disease

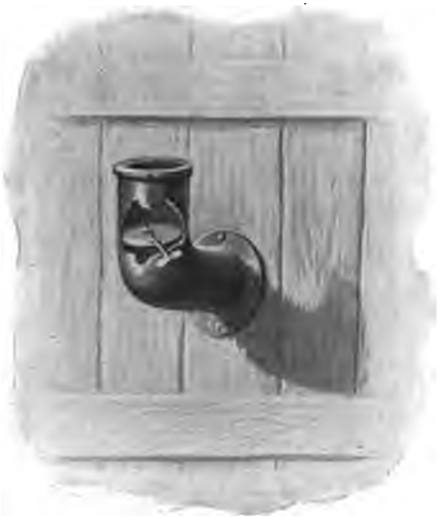
HYGIENE is sometimes called "preventive medicine," and sometimes "the prevention and restriction of disease." To *prevent* disease is what it always tries first to do, because it is always wiser to prevent any bad thing than to try to cure or make it better afterward. To have air pure, we must first keep those things out of it that make it impure.

All air impurities not preventible but to be made less

Of course we cannot help some impurity of the air. We cannot help making the air bad when we breathe, but we need not breathe over and over again the air that we and others have poisoned. We can constantly let out the foul air from a room and let in an ample supply of fresh air. We can prevent things from spoiling the air outside our houses, and we can help to purify it. There are a few bad things that we cannot keep out, but we can steadily lessen their number. We can let in more fresh air, and remove some of the taints that we make within the house. Where everything is made clean and *kept* clean outside the house and in, there will be much less change of air needed than where impurities are many. A great authority has truly said: —

"Ventilation (the changing of house air by special means) should only begin after *cleanliness* has done all that it can do."

Keeping the air out-of-doors pure and sweet is partly the duty of those who have the care of the *public health.* They should see that the smoke and gases of factories, etc., are not allowed to escape into the air; that house refuse is not allowed to gather and rot; that the streets are kept clean, etc. But it is *our own* duty to keep the air in and about our homes pure.



SHUTTER AIR-FUNNEL WITH DAMPER

The duty of health officers

To keep the house-air pure: —

The air made foul by our breathing and by what is given off by the skin must be often let out and fresh air let in; but by keeping clean we can very much lessen the impurities given off by the skin. We must first of all stop crowding many persons into rooms which can hold only enough air for a few. We must stop shutting the fresh "night air" out from our houses by tightly closing our doors and shutters at nightfall.

Foul air must go out and fresh air come in

Florence Nightingale, the famous English nurse of the Crimean war, once asked with good sense, "What is one to breathe in the night *but* night air?" We shall find slight harm in "night air" if our houses are raised a little from the ground and placed where the wind can blow about and under them; if the pools of dirty water and the animals that we often find under them are taken away; if the soil under and about them is well drained, and any filth that has been buried in it or thrown upon it, is removed; if some of the heavy trees that grow close about them are cut away, and if mosquitoes and other insects are mostly kept out. All these things are possible even to the very poor. Most of them can be easily and cheaply done, and are well worth doing.

VENTILATING SHAFT

Night air not necessarily bad

We must let in still more fresh air, and by having proper chimneys and air-openings in our

Offset the air impurities with more air

walls, make it easy for the smoke and gases to escape quickly. We can very much lessen the smoke, gases, etc., by giving more air to wood and charcoal fires, and by never lighting them except under chimneys or outside our houses. The use of coal-oil and oil stoves, instead of wood and charcoal fires, will do very much for health, economy, and comfort, in tropical countries. No one should ever sleep where charcoal or other gases have been escaping into the air. Better care of candles, lamps, and gas-lights will very much lessen the amount of smoke, gas, and partly-burned particles that they give off. Tobacco smoke poisons the air for a long time, unless driven out by fresh air. It should be got rid of as quickly as possible.

Health Maxims

It is better to prevent an evil than to cure it.
To have air pure, we must keep out of it those things that make it impure.
We must keep the air in and about our houses pure.

QUESTIONS.

1. What does hygiene try first of all to do?
2. What is meant by ventilation?
3. How can we help breathing over again the air which has been poisoned in the lungs?
4. How can the impurities of the air inside of our homes be lessened?
5. What is the hygiene of a municipality called?
6. What part of the work of keeping the air outside the homes pure should be done by the municipality?
7. How can we lessen the impurities given off by the skin?
8. How can the air outside the homes be made better?

CHAPTER VI

HOW TO HAVE ENOUGH PURE AIR (*continued*)

Air pollution very difficult to prevent and remove

To remove the poisons of rotting animal and vegetable refuse; to prevent the bad odors and vapors of sewers, drains, cesspools, and the like; and to avoid the stench and dangers from the solid and liquid waste of the body, is everywhere a most difficult part of hygiene.

How the chief causes of air pollution may be overcome

All refuse should be removed from the house as quickly as possible. While in the house it should be well covered and away from flies and other insects, which carry its poisons — sometimes very deadly — to persons and animals.[1] When outside the house, if properly burned or buried, nearly all its foul odor and power for harm will be destroyed. The bad smells and dangerous vapors from sewer-pipes, drains, cesspools, etc., can be prevented, or much lessened, by letting plenty of fresh air and water run through the pipes, etc., and by the use in them of lime and other things which we call disinfectants. The stenches and dangers arising from the waste of the body are among the worst enemies to life and health in hot climates. These can be prevented and overcome only by the greatest care. We must not let any such waste gather and remain in or about our homes. It must not be thrown upon the ground anywhere near our houses or near any wells, springs, or streams whose water is used for cooking or drinking.

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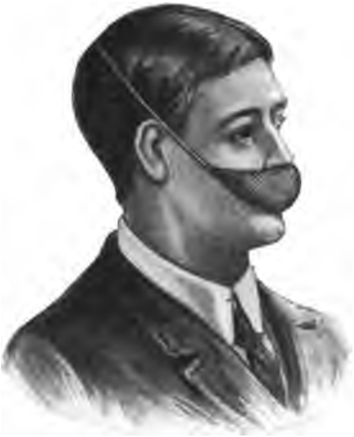
[1] A very deadly disease called both *charbon* and *anthrax*, which is often found in hot climates, in both men and animals, has been carried to others by flies that had been feeding on rotten meat.

GARBAGE BARREL WITH COVER

In smaller places and in the country, all such waste should be buried in pits made for it, which must be kept as dry as possible, and often covered with plenty of dry earth, lime, or ashes. These pits should be often emptied and their contents used as fertilizers.

Ventilation for trade impurities

In different trades and factories, the free use of fresh air and the removal of the dust and fumes by special means must be most relied upon. Each trade has its own dangers, and these must be met by proper means suited to each. In some, breathing through gauze, cotton fibre, etc., is helpful; in others, wetting the materials and the air by spraying with water, etc., will do much to protect the lungs.



MAN WITH RESPIRATOR

Air impurities from the soil due to Nature and man

It is most difficult to keep the air about us free from the poisons which arise from damp and filthy soil. The heavy rains fill the soil with water, and the quick death and decay of all plants, and of great numbers of animals and insects, make it filthy with rotting animal and vegetable matter. These things Nature does. Man makes them worse by his neglect. If Nature did not do much to offset and man did not help her, this class of air poisons would do more than all others to bring sickness and death in hot climates.

Nature does all it can to prevent harm. Man does not

The air out-of-doors is never quiet. When it moves gently it helps to dry up dampness, and its oxygen burns up foul matter. When it moves faster — as when the wind blows hard — it dries things up much quicker, and blows away and scatters the fogs and vapors. The sun's heat also rapidly dries up dampness and filth of all kinds, sucks the water out of the soil and stores it in clouds for rain. The plants and trees, through their leaves, take up as food for themselves some of the gases that cause decay, while their roots take up water and some of the things rotting in the soil. Lightning and storms help purify the air.

Yet enough dampness, vapors, and germs of disease from the great mass of decaying matter always in the soil, escape into the air that we breathe, to bring fevers and other diseases.

Our means to offset these air impurities

The chief things that we can and should do to lessen this kind of air poisoning, are to keep warm and dry enough not to be chilled; to keep our houses dry and the soil about them well drained; to keep the blood rich enough by pure air and good food to resist the germs of disease, and to have sunlight and *oxygen* enough about us to destroy these germs.

Remedies for air impurity

If we are to have the benefits that pure air brings, we must everywhere let more sunlight and fresh air into dark, damp, and dirty rooms. If we are to have good health we must not live in too small rooms. We must keep our houses and the soil around them clean. We must keep our bodies and our clothing clean. We must

CROWDED PEOPLE AND ANIMALS

have fresh air, changed often, and must not permit people to live huddled together with domestic animals to breathe and poison the air. All these cost but little if each one does his part, and would save and pay back in health, money, comfort, and happiness, many times their cost.

QUESTIONS

1. How should the refuse in the house be cared for?
2. How should that outside the house be treated?
3. Should any waste be allowed to remain in or about our houses?

4. How can the dangerous vapors from drains, etc., be overcome?
5. What can be done to prevent harm from the dust and fumes of trades and factories?
6. How does the wind help make the air purer?
7. How does the sun help to purify the air?
8. What are some of the things we can do to lessen the bad effects of impure air?
9. What are two great enemies of disease?
10. What are three chief causes of disease?

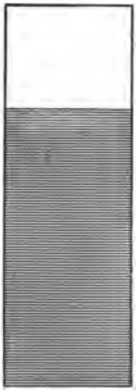
CHAPTER VII

FOOD AND WATER

Food the second need

The second supply that a child must have is *food*. For some time after its birth, its food-supply must be liquid, as the child has no teeth. And all through life a large part of our food is liquid, which does not need chewing, and much is taken as drink.

Water is a large part of nearly all food and is itself, as our chief drink, a most important part of the food supply. We need it also for cooking and preparing much of our other food. When we know that nearly three fourths of the weight of the body are water and that the body is made up of what we eat and drink, we can see that we need and must have a great deal of water.



THE SHADED PART REPRESENTS THE PROPORTION OF WATER

Foods used by man may be either animal, vegetable, or mineral.

Animal food is not only the flesh of such animals as the bullock, sheep, pig, or goat, but also that of fowls and fishes, and in hot climates, of many reptiles and insects not eaten in colder countries. Eggs of birds, fish, and turtles, and also milk, butter, and cheese, are animal foods.

Vegetable food

Vegetable foods include all grains, such as wheats, maize, rice, beans, etc., with everything made from them, such as bread, rice cakes, tortillas, and macaroni. All roots, tubers, vegetables, etc., like beets, turnips, yams, yautias, sweet potatoes (*batatas*), and cabbage, with their products, — such as cassava, tapioca, arrow-root, and sauerkraut, — are also vegetable food. So are all fruits, — cocoanuts, bananas, bread-fruit, oranges, and the like; as are also the sweets, — such as sugar, honey, etc., and the oils made from olives, peanuts, and cottonseed.

SOME FOOD ANIMALS OF THE TROPICS

Mineral food

Mineral food includes three most important items, — water, lime, and salt. Besides these are iron, lime, phosphorus, soda, etc., not eaten by themselves, like salt, but as found in other articles.

As our bodies must be built up and repaired from the food we eat, we can see that we must have in it everything of which the body is made, or that it needs to work with.

The food classes

All articles of food belong — according to what they are made of — in one or another of four classes. These are: —

1. The *proteids*, which are made up of *albumen*, like the white part of an egg; of *casein*, like the curd of sour milk; of *myosin*, found in lean meat, and a few other things;

2. The fats and oils;

3. The starches and sugars, and

4. The minerals, — like salt, lime, etc.

Some classes in two or more kingdoms

Some of these, such as fats and oils, are found in both animal and vegetable food. Vegetable albumen is found in wheat and other vegetables, and in nuts. Vegetable casein is found in beans, peas, and nuts. All four are found in two articles of food, eggs and milk, both of them animal foods, either of which could supply everything needed by the body. Knowing this, we understand how very young children, though growing fast, can live and thrive on milk alone. Bread, though chiefly a vegetable food, would also alone nearly support life, but milk or other fat, and salt are generally used in making it.

TROPICAL FRUITS AND VEGETABLES

All food is at first vegetable

Most of our food comes in the first place from vegetable growths or is made from them by the help of the sun. We eat the vegetables and change them into blood, and the sun's heat and energy which was in them becomes ours. Or, our bullocks, sheep, and fowls eat these grasses, vegetables, or grains, which become their flesh. This we eat and it becomes our blood, flesh, heat, and energy. Even the fishes feed under water, upon vegetable and animal growths formed in the same way, and when we eat them, we eat what the green leaves had borrowed from the sun and made into the starches, sugar, etc., of the water-plants.

Even fish food is originally vegetable

QUESTIONS

1. We have seen that air is the first thing the child needs. What is the second thing?
2. Why must the child first take liquid food?
3. What liquid forms a large and important part of our food?
4. What is animal food?
5. Name different kinds of vegetable foods.
6. What mineral substance do we use with our food?
7. What two articles of food supply everything needed for the body?
8. What is the best food for little children?
9. Where does most of our food come from in the first place?
10. How does our animal food come from vegetable growths?

CHAPTER VIII

WHAT OUR FOOD DOES

Four things that food should do

OUR food has four principal things to do: —

1. It must build up the body and repair its hurts and waste.

2. It must supply fuel for heat to keep the body warm.

3. It must supply the fluids, juices, etc., of the body, such as saliva for the mouth, gastric juice for the stomach, bile for the bowels, oil for the joints and hair, wax for the ears, etc., and

4. It must give the energy for all our bodily actions, our thinking, moving, seeing, hearing, etc., which all depend on the food we eat.

Food needs of young and old

Young and growing persons eat more in proportion to their size and age than those fully grown. They need more to supply the growth and changes of the body. With adults, food is not needed for growth, but all through life it is necessary to mend our hurts, make up for the constant wear, waste, and loss, give us heat and supply power.

Food must supply what the body is made of

The body, too, is all the time changing, and new blood, bone, and muscle are taking the place of the old and worn. As we have seen, animal and vegetable food are made of the things of which our bodies are made, albumen, casein, fats, starches, salt, etc., and so can supply the new portions needed. Our mineral food must supply a few things besides water, such as the lime and phosphorus which go into our bones and teeth, and the sulphur and phosphorus which the brain and nerves must have.

NURSE FEEDING WOUNDED SOLDIER

Food is like fuel, and gives heat and power

It is not easy to tell just how food makes heat and energy, but a large part of what we eat goes to make them. Food is used very much as wood is burned to make water into steam in order to move an engine. Food can be burned in a fire and will make heat, and heat has power in it. The same food used in our bodies, though more slowly, will give out heat, and this will make power for our muscles, and the work of the heart, lungs, stomach, etc. When we are very active and work or play hard, we need more blood as well as more air, we use up more muscle, and make more heat, so we need more food to make up the loss.

FEEDING COAL TO AN ENGINE

The fluids of the body needed to change food into blood

The saliva which moistens our mouths; the gastric juice which comes from the glands of the stomach; the bile, a yellow fluid which comes from the liver; and some other fluids, are all of them necessary to work over and change the food into blood, etc. They must all — as well as the fluids which make the joints and eyes move easily

— come from food, as much as the parts or glands themselves which give them out.

Nerve force depends upon food

All bodily actions too, both those which go on whether we are asleep or awake (like breathing), or those which we direct (like speaking), use up a certain amount of power, called *nervous energy*. So do all acts of our senses, — such as seeing, feeling, etc. We know this power depends upon food, though we cannot tell just how it is made.

Different kinds of food necessary

Not all foods act alike or supply the same things. For this reason many kinds of food are needed and many are given us by Nature. In a general way we may say that meat makes muscle; sugar makes fat; fish and cheese make bone and flesh; starch makes heat and power. Some will do the same things better and cheaper than others; sugar and rice will make heat and fat; lean meat, peas, beans, and milk make flesh. Some foods, like fruits, vegetables, and fish, are better for hot climates than for cold. Some should be prepared and cooked in certain ways, some need other ways, or no cooking at all. Some are good to use if they are in a certain condition, — ripe, soft, firm, sweet, etc., — but are bad if not so. Fresh eggs and milk are the best of foods, but stale eggs and milk are unfit to eat. Sweet fats are good food, but rancid ones are bad.

Some food must be cooked

Poor foods

Certain articles of food are often mixed with cheaper ones for the sake of profit, and so their character and value as food are very much lessened. Where food is scarce and its price is high, hunger and sometimes famine, often disease and death, will come.

Lack of food brings sickness

Food must be pure and sufficient

If we are to have health, our food, like the air we breathe, must be *pure* and we must have *enough of it.* To have it so, it must be cheap, for unlike air it must be created and costs money. Whatever makes food *pure* and *cheap* does much for every one's health.

QUESTIONS

1. What four principal things must our food do?
2. Why do young persons need more food in proportion to their size than older ones?
3. How is the food we eat like the fuel burned in an engine?
4. Why do we need more food when we are active in work or play?
5. Why do we need different kinds of food?
6. What kinds of food make fat?
7. What foods are better for hot climates than for cold?
8. What happens where food is scarce and high-priced?
9. To have good health how must our food be?

CHAPTER IX

HOW MUCH FOOD DO WE NEED?

MANY people who live where food is plenty and cheap often eat too much and so bring upon themselves certain diseases, such as indigestion and other ills of the stomach. Many others, everywhere, suffer from hunger and the diseases that come from want of food or from food that

Errors in food

is poor and unfit. Much unfit food is often eaten —especially in hot countries — because people do not have any that is better. Yet many times there are good foods to be had by little effort, if those suffering from hunger only knew how to get them. Many unfit things are eaten that might be made good by proper cleaning and cooking, as we shall see.

Food values

The chief value of *animal food* is its power to give vigor and activity, and meat does this better than milk, yet one can get along with very little meat if he has enough other good food. Children require very little meat, while fish, butter, cheese, eggs, beans, and peas will supply nearly all that meat would give to a grown person.

Food needs

Sometimes when meat is scarce one has a strong craving for it, like that of a thirsty person for water, which usually shows that the body needs it. We know, too, that pure starch or sugar-foods — like rice, yams, or sugar-cane — will not alone long sustain life, though rice, with the addition of a little fat, is the principal support of millions of people. Beans and peas contain, beside starch, a large amount of what is most useful in meat, and go far to take its place.

GATHERING SUGAR CANE

The quantity and kind of food needed

The quantity and kind of food needed to keep one in good health vary in many ways. Men require more than women, while growing boys and girls need as much as men. A person who is working hard in the open air usually needs more than one whose labor is light and who works

ESKIMOS KILLING WALRUS

in the house. The natives of very cold countries, like the Eskimos, need and consume very large quantities of food, and especially of fats and oils (such as walrus and whale fat); while people in the tropics eat much less, and largely of fruits, vegetables, starchy and sugary food. A candle is as good to Eskimo children as candy is to children in warmer countries. As a general rule the appetites of people — unless they have been injured by their habits — are pretty good guides to what they need in the way of food. Sometimes the stomach gets out of order, from loss of sleep, from heat, fatigue, bad food or water, or the over-use of tobacco or alcoholic drinks.

Appetite usually a safe guide to food

Then the appetite ceases to be a safe guide. An appetite may easily be made poor or peculiar, by habit.

Habit in eating

One's habits as to food do much to fix the quantity that each feels he must have. Any person who has had the habit of eating three full meals a day, of certain foods, does not easily get used to the habit — common in hot countries and in parts of Europe — of having only a cup of coffee and a piece of bread on rising in the morning. The heavy "breakfast" at noon and the full dinner at night do not make up the sense of loss to him, even though he eats as much in one way as in the other.

One meal a day not enough

The "one-meal-a-day habit" of parts of South America and other countries, is a bad one. It would not satisfy, if it did not injure, any one who had been used to having two or three meals a day. Any long-followed habits of eating, as to hours, number of times a day, or kind and quantity of food, should not be changed suddenly. Whether these habits at first came from real wants of the body or not, the body has become used to them, and they may serve as guides to health in the matter of food. It seems to be true that one most readily takes a cold or fever — and perhaps any disease — when hungry, tired, weak, or asleep.

Digestive fluids do harm in an empty stomach

In a stomach empty of food, any juices that are there to digest food do harm. Few things are worse than the habit followed by some, of eating nothing from bedtime until noon the next day. One needs, even in the tropics, at least a light breakfast after rising, — a cup of coffee, or bread, or fruit, or perhaps an egg. If one is to do hard work, especially if out-of-doors, until noon, one should eat more than if to do only light and slow work, indoors.

HEAVY WORK OUTDOORS — CLEANING COFFEE

One needs a morning meal

There is no doubt that where food is plenty and cheap, nearly every one over-eats, or that where food is usually scarce, there is often not enough to sustain life and health properly.

Guides to how much to eat

The best and most practical guides we have as to how much we ought to eat are a healthy appetite, used with good sense; good habits of eating; and the feeling after eating that one's wish and need for food have been satisfied. We should always use moderation and self-control in eating and drinking, and eat and drink less rather than more than the appetite calls for.

Regular meals and a little food often the best plan

It is best to eat regularly, and the custom of a light early breakfast with two larger meals at noon and night, is, on the whole, a good one, especially for the tropics, but one should eat when one feels the need of food, as one drinks when thirsty. It is better to eat little and often, rather than less often and much. Little children should be fed every few hours. Where food and water are scarce, and the people are poor and hungry many things are eaten and drunk that are not fit for food. In great famines, like those of India, where thousands starve to death every day, *anything* that will keep the poor people alive is eaten greedily. But *to keep the body in good health*, we know that we must have *enough* pure and proper food of different kinds. This food should be clean, and certain kinds should be properly cooked. The water that we drink and use in cooking should be *plentiful* and *pure*.

For health one must have enough pure food

We must do our best to come as near to these conditions as we can.

We have been thinking about the *quantity* of food we should have. Let us see *what kinds* we should have for health, and can best have in tropical countries, and how they can and should be best kept, prepared, and cooked.

QUESTIONS

1. What is the chief value of animal food?
2. What other things that cost less than meat will very nearly supply its place as food?
3. What classes of people need more food than others?
4. What kind of food is needed by the people of very cold countries?
5. How may our appetites become unsafe guides as to the food we need?
6. How do people's habits differ as to times of eating?
7. Upon what does the kind and amount of food we need depend?
8. What are the best guides as to how much we ought to eat?
9. How often should little children be fed?

CHAPTER X

THE KINDS OF FOOD

Tropical food needs and possibilities

There are many things to think of as to the *kinds* of food to use. We should choose first what we *need* to build up the different parts of our bodies, to give us heat, strength, etc. We should not think only of that which tastes best, though if what we eat tastes good, it helps digestion. Then we must think of what food we can get to meet these needs, and whether we can add new articles to the list, — for there are sources of food-supply all about us in the tropics that are little known and used. There are still others which we might have by a little effort.

The Kinds of Food We Need

Food to make the different parts of our bodies, — the muscles, fat, bones, etc.
Food to give heat, and repair hurts, etc.
Food to give strength to work, etc.

Next, we should think of how we can keep our food longest in good condition, — for we know that both animal and vegetable foods spoil very quickly in hot climates.

Food must be good as well as plenty

We must remember that though we may have enough, and of the right kinds of food and drink, they will not be fit to eat if they are fermented or decayed, or are tainted, or smell bad, or are full of insects. If our meat is spoiled or the fish is bad; or if the milk is sour; or the butter or fat is rancid; or if the eggs are old; or if the cheese is mouldy, we must not eat such food. If the fruit and vegetables are soft and rotting, we must destroy them. If the flour or bread is sour or musty; or if the salt is dirty, or if the water is thick or foul, they are not fit for us to use and will surely bring us pain and sickness.

Care in food will save life and health

Many deaths and very much sickness might be prevented in hot climates by only a little care as to the food and water used. Every year children die by thousands in the tropics, because of the unfit food they eat, and many are all the time ill and suffering from the same cause.

Foods for some are poisons for others

Each person should learn what food and drink are best for him. Certain foods can be eaten without harm by some, while they make others very ill. Some stomachs cannot take acids, like vinegar or limes, without distress. Cheese is good food for most persons, but makes some very ill. Fish, lobsters, shrimps, etc., though good food for many, cause others to swell badly, and make the skin itch and burn painfully. Some fruits and berries will cause bowel and other diseases, and great pain in some, though in no way hurtful to others.

Impurities in our foods dangerous

Lastly, we must be very careful about the cleaning, preparing, and cooking of our food. One of the very first things with both food and water, as with air, is to make sure that they *are pure and clean.* Any kind of impurity that gets into our stomachs in what we eat or drink may do much harm, though we may not see or feel it at once.

MAN CLEANING FISH

Food should be carefully prepared

It makes a great difference whether or not food is rightly *prepared.* Some things, like salt fish and beans, need long soaking before being cooked; meats and fish often need to be trimmed, scraped, and salted; fowls need to be "drawn" (cleaned), "picked," and "singed;" bread must rise properly; while certain parts of meat, fish, poultry, vegetables, etc., should be carefully cut away or they will make the rest taste bitter or tainted.

Good cooking very important

Nothing can do more for our health, comfort, and happiness than the proper *cooking* of our food and even of much we drink, — such as our water, coffee, and tea. Proper cooking will make much poor food good. It will take away dangers from some, and bring out all that is best in others. Some food is worthless or unfit for use without cooking; other food, which could be eaten raw, is greatly improved by it.

Next in importance to having *enough* food, and of the *right kinds* and *quality,* comes *good cooking.* A fresh egg which is good even raw, and is better still if slightly boiled, is not good food if hard boiled.

QUESTIONS

1. What kinds of food should we first choose?
2. Should we always choose the food which tastes best?
3. Is it well to have variety in our food?

4. What happens to food when it is kept too long in warm weather?
5. How may many lives be saved every year?
6. What causes the deaths of many children in tropical countries?
7. Are the same kinds of food always healthful for all?
8. Name some foods that are very good for some people and bad for others.
9. In preparing our food what should we be careful to do?
10. What is next in importance to having plenty of good food?

ZEBU OR INDIAN COW IN THE PHILIPPINES

CHAPTER XI

THE KINDS OF FOOD (*continued*)

WE have seen that the body needs many things to build it up and give it what it requires to work with, and that these mostly come from our food. We have seen that these things are needed in different quantities, and that only a few articles of food — such as eggs, milk, and bread — contain them all, while certain foods have more of some one thing — like starch or oil — than others.

The materials of which the body is built

We find that animal food, such as meat, milk, eggs, cheese, etc., has more of certain needed things (the *proteids*) than vegetable food. We find that grains, fruits, and vegetables have nearly all the sugars and starches; and that fats and oils are found in both animals and vegetables, and that the minerals, like water, lime, salt, iron, etc., are scattered all through our food. Some foods help us to one thing, some to another, and we need them all.

As we should soon get tired of any one kind, we mix our foods, change them often, and cook them differently, and so get better results and pleasanter tastes. The people of the tropics differ much among themselves. Their food, water, and fuel supplies are not the same. Their habits, their climate, and what they have been taught, make very great differences in their ways of living, and especially in their food. But all must have the same materials from which to build their bodies.

Ways of living are different, but all must have food

CARABAOS OR WATER BUFFALOES OF THE PHILIPPINES

Animal foods

In some tropical countries, like Porto Rico, parts of South America, etc., beef and milk cattle and some other food animals are plenty, while in Cuba and the Philippine Islands several years of war have used them up, and cattle diseases keep them from increasing. In other places want of grass and water keeps them out. Goats are found and

Goats and their products

thrive well almost everywhere, and make one of the best supplies of animal food for the tropics, especially for the very poor in the country. They cost little, and eat almost any kind of food. They are quite free from disease, their flesh is good, and their milk and cheese are excellent. Nothing would do more to give the poor country people of a hot climate a better and increasing supply of good animal food than to help every family to keep goats. Goats' milk and the cheese made from it are rich in the parts of milk that make good food.

GOATS

Pork, poultry, and their products

Pigs and poultry are good sources of meat-supply in some parts of the tropics. When free from disease and properly fed and kept (though this, especially as to pigs, is not often the case), they furnish good food. Sheep are not well suited to hot climates, and their flesh is not as good as in colder countries, but swine and poultry thrive with proper food and care. Flesh food should never be eaten raw.

Stock food from the yucca

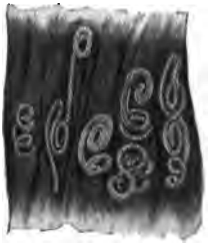
Wherever the yucca (*manihot*) is grown, it will furnish good vegetable food in great quantity. By the use of its refuse for livestock, animal food can also be made plenty and cheap.

Certain parts of cattle and swine, much eaten in the tropics, such as the stomach, heart, kidneys, liver, etc., if in health, and carefully cleaned and well cooked, are safe and good food. They are, however, often diseased, and then may do much harm. Care should be taken in using them.

THE YUCCA PLANT

Trichinæ, etc.

Fresh pork and its products should always be most thoroughly cooked, as they often contain certain worms, *trichinæ*, etc., which cause fatal disease if taken into the stomach. Bacon and other salted pork foods (hams, sausages, etc.), if well "cured" and cooked, are good food, though not the best for the tropics, as they are heat-making, greasy, and slow of digestion. Unless well cooked they are likely to cause disease of the stomach and bowels.



TRICHINÆ IN PORK

Reptiles, etc., not fit for food

There are many wild animals in some parts of the tropics that are fit for food; but certain animals, and the entrails of animals; insects, snakes, and other reptiles sometimes eaten, are *not* fit for food, and some of them we know cause illness.

IGUANA LIZARD

Good for food

Fish are often plentiful in tropical waters. But in some places, as in Porto Rico, they are quite scarce. This is owing to the great depth of the water, which prevents the growth of food for fishes. In some places but a few miles from the coast fresh fish are never seen. Fish are usually excellent food when fresh, but wholly unfit and often highly poisonous when stale. They should

Objection to fish as food

never be eaten raw, and even the shell-fish — lobsters, craw-fish, shrimps, etc. — are safer when cooked. They often cause stomach and skin troubles when eaten raw. Oysters, which are excellent food, are not used as much as they might be, as they can be readily grown.

MARKET AT PONCE, PORTO RICO

Dried salt fish as food

Dried salt fish (*bacalou*), the chief animal food of some tropical countries; and smoked fish, — such as dried smoked herrings, etc., — are good food when sound; but they are often badly "cured," or partly spoiled, and if so, are sure when eaten to cause some serious sickness.

It is the duty of those in charge of the *public*

The duty of health officers as to food

health to see that only healthy animals are killed for food, and that their flesh, and all fish, vegetables, and other food, are rightly inspected, prepared, kept, and sold. But we must be careful ourselves that the half putrid meats and fish, the dirty bread and the stale fruits and vegetables so often found in the markets, do not get into our houses as food to cause illness.

The difficulty of keeping food

We cannot hope to keep foods in hot countries as they do in cold ones, as ice and "cold-keeping" are costly, and are often not to be had. But if our meats are well bled, are kept from flies, and are sprinkled with salt, or washed with soda water (some of the so-called "preserving powders" are of use), and hung in the coolest places until cooked, they can be kept some time. Partly cooking meat helps much in keeping it. Butter, milk, cheese, and honey are best kept in tight glass jars, and should be as cool and as free from taints and smells as possible. All these foods change very quickly and disturb the stomach if they are spoiled. Milk is very easily tainted, and often carries germs of disease. Vegetables, fruit, bread, and other foods, if stale, mouldy, or decayed, are unfit to eat, and quickly cause sickness. Nothing else will so surely prevent *all* kinds of animal and vegetable food from doing us harm *as thorough cooking.*

Means of keeping food

Much food that might be had

To have plenty of good food and to have it cheap, we must make good use of the things about us. There are many fruits, vegetables, and other sources of food not used at all in some hot countries, which are largely used in others. We get in some places only a small quantity of certain kinds — such as cabbages, onions, tomatoes, guavas, etc., of which we might easily have plenty.

More and better food is almost everywhere badly needed in tropical parts, yet many of the finest vegetables (beans, peas, sweet corn, asparagus, etc.), which will grow well, with but little effort, in Cuba, Porto Rico, the Philippine Islands, and other places, are little planted. Cabbage growths of several kinds are to be had wild and

TONDO MARKET, MANILA

Vegetables

in large quantities, in some of the Philippines, and elsewhere. But these and certain tender shoots, leeks, cresses, salad plants, etc., which are good for food and grow everywhere, are little known or used. Very little honey, and that mostly wild, is gathered in Porto Rico and some other countries which are fine fields for bees, and where we should get many times as much. Cotton-seed oil, peanut oil, and peanut butter are good food articles, though little made or used in countries where they should be plentiful.

Honey

Food available

A TROPICAL BEE FARM

Of rice, sago, tapioca, cassava, or macaroni, milk, butter, cheese, etc., — all of them easily had in large quantities — much less is produced than should be. Both health and wealth are to be had in these good foods. We must learn to use what we have, to make the most of it, and to increase it. Some grains, many small fruits, and almost every kind of vegetable will grow well in hot countries, and all are good food. We can have *enough* for all, if each will do his part.

Health and wealth to be had in good food

QUESTIONS

1. What foods contain most of the things needful for the body?
2. What kinds of food contain the proteids?
3. What foods have the sugars and starches?
4. What minerals appear in our food?
5. Why do we need these various kinds of food?
6. How can we change and improve our foods?
7. What tropical countries have plenty of cattle for beef?
8. What has made them scarce in Cuba and the Philippine Islands?
9. What other animal is very useful in providing food in hot countries?
10. Why should pork always be well cooked?
11. What foods come to us from the sea?
12. What is the duty of the municipal health officers in regard to foods?

CHAPTER XII

COOKING, ETC.

Fire not used at first to prepare food. Now used everywhere

LONG ago the food of man was probably composed almost wholly of fruits, grains, milk, and a few roots and vegetables. Men did not then use fire to get food ready, or to make it better for eating. Everywhere to-day fire is used for cooking, though at least two thirds of the people upon the earth have little more to eat than at first.

Fire and cooking now a necessity

The large use of fish and flesh, the greatly increased use of fruits, grains and vegetables, and the better ways we have found of putting foods together, have made the use of fire a necessity.

The preparation of food for cooking important

The care used in preparing food for cooking has a great deal to do with the way it tastes, and in preventing dangers to health. It is most important to have food clean, sound, and sweet — not dirty, bloody, sour, or tainted. We need plenty of pure water for cleaning meat, fish, vegetables, etc., and to make them fit to cook.

We also need water for cooking them in some ways. If we wish to be well and enjoy our food, we must not mind the labor that it sometimes costs to get it and prepare it.

Danger from the soil in vegetables not cleaned

The worm that causes anæmia

Very often foul matters of different kinds, some of which have helped them to grow, but at the same time carry in them the seeds of disease, cling to our vegetables when we dig them for cooking. This is especially true in hot countries, where the habits of living are often careless and where all kinds of decaying matter are spread, or buried, about the house and in the fields and gardens. It has only lately been found that in hot climates a little worm lays its eggs in the earth where filth has been buried, and these eggs are often taken up with the dirt which sticks to lettuce, radishes, etc., when they are pulled. From these, and the hands, their eggs often get into the mouths and so to the bowels of those who eat these vegetables. The worms that hatch from them at once go to work to spoil the blood and bring on the disease we call *anœmia,* so common in its worst form in hot climates, in which those

Tape worm Lumbricido

TROUBLESOME WORMS

who suffer from it become thin, pale, weak, and wretched, and often die.

Food must be carefully cleaned

For this reason and others, meat, fish, and vegetables must be well washed, scraped, and trimmed; some of our fruits and vegetables must have their skins taken off, and the hard parts of some should be cut out. Fish, fowls, and animals must have their entrails removed and be well washed, cut up, and salted. Some of the grains, vegetables, dried fish, etc., should be put into water to soak and soften, while some salt fish, meats, etc., must be cut into pieces to cook well. By putting all our food articles in the cleanest and best condition for cooking we shall both remove some of their dangers and get the most good from them.

Food if pleasant to sight and smell digests better

It is useful to put food into its most attractive form. Food that looks well and smells good increases our desire for it. We enjoy it more and so digest it easily.

Among the chief uses of cooking are the following: —

The uses of cooking

Cooking draws out certain good qualities in food which we could not otherwise get, — as gelatin, fats, etc., from bones and other parts for soups;

It kills or destroys certain dangerous things in food, — like *trichinæ* and tape-worms in pork, moulds, etc.;

The chief uses of cooking

Uses of Cooking

It gets the good out of food which we could not get without it.
It destroys or makes harmless some dangerous things in food — germs mould, etc.
It makes many things taste better.
It gives heat to food which would not be as good cold.
It improves many kinds of food.

It makes many foods taste better, adds other things to them, and brings out new flavors, — as in the roasting and dressing of fowls with herbs, etc.;

It gives heat, and warm food is often better for us than the same food cold, — as with soups, mutton, coffee, etc.;

It lightens up and works all parts together, as in making bread, etc.;

Roasting improves certain parts of meats, etc., and saves the nourishing juices and flavors; while boiling improves many kinds of grains and vegetables;

Cooking softens tough parts and fibres of meats and vegetables and makes them tender, — as in beef, pork, turnips, cabbages, etc.;

The chief uses of cooking

It softens and breaks up the hard grains, starch-granules, and root-cells and fibres, and sets free the food in them, so that it can be taken up by the stomach, — as the starch in maize, rice, yams, oatmeal, and tapioca;

Sometimes cooking makes new parts and compounds which add to and improve the food, — as the malt-sugar from the starch in the crust of bread in baking;

It lightens up and works all the parts together, so that air, ferments (yeast), salt, etc., are mixed into and through the whole, which is so made healthier and sweeter, — as in making bread;

It draws out from some food the surplus fat, or changes it into better form, — as in boiling or roasting meats, etc., and —

It gives, in some ways, — as in frying, — a quick, strong heat which lessens the amount of fat soaked up and improves the taste and color of some foods, — as in frying fish, bread, potatoes, etc.

QUESTIONS

1. What foods were eaten before men learned the use of fire?
2. What does fire do to our food?
3. How should food be prepared for cooking?

4. What may happen if vegetables grown in unclean soil are not properly cleaned before being eaten?
5. What is the use of putting food into attractive form?
6. What are some of the chief uses of cooking?
7. How does it lessen some of the dangers in our food?
8. How does cooking make foods more digestible?

CHAPTER XIII

COOKING (*continued*)

The means of cooking not always easy to get

IN tropical climates the things that we need for cooking — such as cheap fuel for the fire, water, good utensils, etc. — are not all usually easy to get. In some parts wood is plenty, and fuel is not difficult to get with a little labor; in others, as in Porto Rico, where there is no coal and but little wood, fuel is scarce and high. In all hot countries the labor of getting fuel, and the wish to have as little extra heat as may be, very much lessen the use of fire, while water is also sometimes scarce.

Ways of Cooking

- Boiling
- Roasting
- Broiling
- Baking
- Frying
- Stewing

There are in common use six ways of cooking food. Each is best for certain things. These ways are boiling, roasting, broiling, baking, frying, and stewing. Because in many places it is hard to

The six ways of cooking

get fuel and water, and there are few things to cook with, much of the cooking in the tropics has always been poor, and much food has been cooked by frying, — the worst of all ways. This large use of the frying-pan accounts for the great amount of grease in the foods of hot climates. There is no real need of so much grease in the diet of the people.

The reason for the "grease habit" in the tropics

Boiling

Boiling must have a fire for a long time, much fuel and water, and a proper kettle. These call for labor and heat which we wish to avoid. Boiling gives us the gelatin from meat, bones, etc.; makes certain tough meats tender; makes fish firm; sets free the starch in potatoes, grains, etc., and destroys *trichinæ* and moulds. It leaves meat rather tasteless, but is safe and healthful, and for certain things, like some meats, beans, rice, etc., is the best way of cooking and causes least loss.

Roasting

Roasting requires a long, steady heat, much fuel, some conveniences, and much care, — all of them things which people seek to avoid in hot climates. It differs from baking chiefly in having plenty of air about whatever is roasted, and is used only for meats, and a few vegetables like yams, maize, etc. It makes parts of the meat solid without making other parts too rough or hard, and brings out its best flavors. It does not surely protect against certain parasites and their eggs.

Baking

Baking needs a slow fire, much fuel, and more conveniences than other ways of cooking, but needs no water. Baking acts upon articles so cooked very much as roasting does, but being done under cover and with little air, the light fatty acids cannot escape, and they hurt the food. For bread, sweet-potatoes (*batatas*), and some other things it is the best way of cooking, even when the ashes of the fire are the only cover. But it does not surely destroy *trichinæ* and some other parasites.

TWO WAYS OF BROILING

Broiling Broiling calls for a low fire, little fuel, little time, and no water. It is the way which is quickest, easiest, and cheapest, so those in hot climates naturally turn to it whenever they can to cook their food. It does not surely kill certain germs, etc., and is wasteful, but it is a healthful way of preparing many kinds of food. A pointed stick often serves a simple people for their only utensil for broiling; but with proper conveniences (such as gridirons, grills, etc.) it is one of the best methods of cooking certain food.

THE WORST WAY TO COOK

Frying Frying needs only a small, quick fire, not much fuel, little time, a cheap frying-pan, and no water. It is on all accounts — except that it is quick, easy, and cheap — *the very worst* way of cooking food. It does not protect against *trichinæ* and their eggs. It usually fills the food with fat, and so prevents the stomach from doing its work. It wastes food, and causes indigestion.

Stewing Stewing, like boiling, must have a slow fire, much fuel and water, though needing little in the way of utensils or conveniences. It gets all that is good out of meat, vegetables, etc., and leaves the food tender and in good condition for the stomach. Where the expense of fuel is not great it is an excellent means of cooking. It is destructive of most low forms of life, parasites, etc.

Our food-drinks

The cooking of our food-drinks is very important. Of course, water is the chief of these. The others are tea, coffee, chocolate, cocoa, etc., which need to be cooked. Of all these water forms a large part. We must not take water from sources near a cemetery, farm yard, pig-pen, or other polluted place. It often happens that the only water we can get for cooking and drinking is made impure by many vegetable growths and animal matters, some of which carry the seeds of disease. *If we boil our water* we shall surely destroy these impurities and their power for harm. It should be a carefully followed rule in all tropical lands *to boil all water to be used in any way for cooking or drinking.* Nothing else will so surely do as much to prevent disease as boiling and filtering our water.

Cooking our food-drinks and boiling our water

Little harm possible from our food-drinks if the water is boiled

If the water which we use in making our coffee, tea, etc., is pure, or is made safe by boiling, no harm will come to us from these drinks except such as may come from drinking them too often, or too strong, or from impurities which are mixed with them.

We see that we need to cook our food and that we get good results from doing it. It is often hard to get fuel, and much food and heat are now lost by poor ways and means of cooking. We shall gain much in comfort, health, and cost, if better and more convenient means of cooking are in common use. Among the most important of these are coal-oil, oil-stoves, and better cooking utensils.

Better fuel and utensils a great need. Oil fuel and oil-stoves

AN OIL-STOVE

QUESTIONS

1. What are some of the different ways of cooking food?
2. Why is it not always easy to boil food in hot climates?
3. How are meats roasted?
4. Why is broiling a good way to cook food in warm countries?
5. Why is frying in fats not a healthful way of cooking?
6. How can water that is to be used for cooking or drinking be made safe?
7. How can great gains in comfort and health in tropical countries be made?

CHAPTER XIV

WATER

We have seen how large a part of our bodies, and of our food, is water; that it is our chief drink, and that we must have it to prepare and to cook much of our food. We must — as with air and food — have *enough* of it, and have it *pure*. Too little water, or an impure supply, are very probably the causes of more than half the disease and death in tropical countries. Water is no less needed to keep our bodies and utensils clean than it is

A WELL IN THE PHILIPPINES

to cleanse, cook, and become part of what we eat. So it is plain that water has more to do with keeping us well, or making us ill, than almost any other thing and that we must do our best to get enough, and to have it pure — or at least to make it harmless. It should be bright and clear, free from color or any bad taste or smell, and should not leave any deposit in the glass — though water is not *always* free from danger because it is bright and sparkling.

Water needed for many things

What it should be

Water is called either "hard" or "soft," depending upon the quantity of certain salts, such as lime, sodium, iron, etc., which it holds. Sea-water is "hard," from the large amount of salt in it; rain-water is "soft." The "soft" waters are best for nearly all our uses, such as washing, cooking, and drinking. Much of the hardness of water is caused by the impurities which get into it.

Water "hard" or "soft," and what makes it so

The impurities of water are chiefly of three kinds: minerals, gases, and animal or vegetable matter. Some of them — mostly those from the decay of animal or vegetable matter, filth, etc. — we know furnish food for the germs of certain diseases. Even running water can carry some of these germs (like those of typhoid fever) a great distance without their losing their power for harm.

The impurities of water

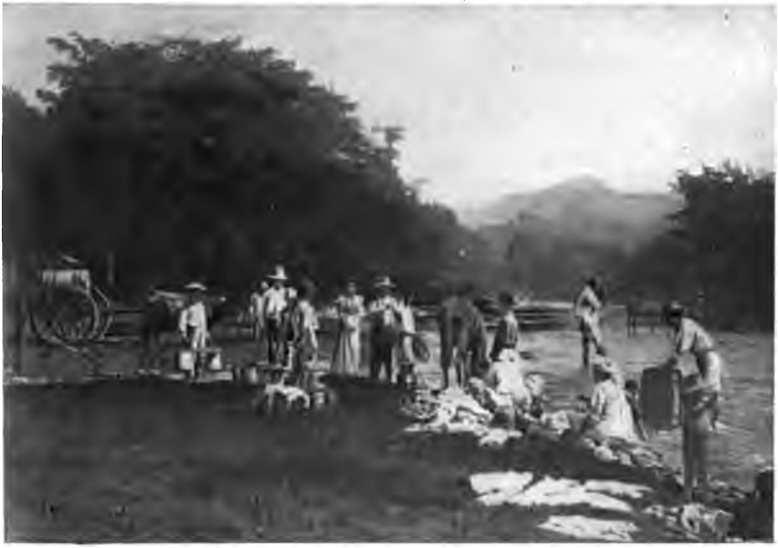
Among the diseases common in the tropics, whose germs are believed to be carried in water, are typhus fever, dysentery, cholera, and agues. Besides the germs of these diseases, certain very small worms or their eggs are often swallowed in the water that we drink.

A DROP OF WATER — MAGNIFIED

We must keep all filth of every kind out of the springs, streams, and wells from which we draw water for drinking. With great care this can be done.

How to keep water pure

Cattle and hogs or other animals must not be allowed to wallow or wade, or women to wash clothes in, or people on the hillsides to throw their refuse into the streams from which people lower down take their water supply. Rotten vegetable and animal matter must not be thrown upon, or buried in, the ground near springs or water-courses for the next shower to wash into them. *Every one* must be *constantly careful* to keep all sources of water supply clean. Drinking-water must always be kept in clean vessels, which should be carefully covered. If not tightly covered, they should be protected with fine netting.



A USEFUL STREAM

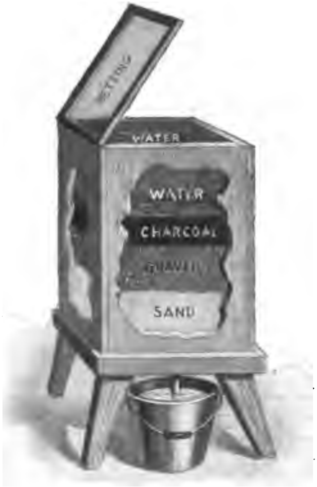
Notice in how many ways these people are polluting the water

How to purify water

But because it is difficult to keep all impurities out of water, we must use every means to remove or destroy those that get into it. If the water we are to drink, or to cook with, is very muddy or sandy, we can filter it in several ways. Or, if we need to use it very soon, we can stir into it a little powdered alum. This will throw the mud to the bottom, and we can then pour or draw off the water, above the mud that has settled. This method has been used for many years by the people on the lower Mississippi River, and in the United States and the British armies.

Filters and boiling

We can run the water through filters of sand, gravel, or charcoal, or the stone filters so often seen in the tropics. *But we must keep these filters clean,* carefully scraping off the green mould and the vegetable growths from the stone filters and soaking the stone in boiling water. Sand, gravel, and charcoal filters must be often cleaned and renewed. We should also *boil thoroughly* all the water we cook with, or drink, *even when filtered.* In these ways we can remove or destroy nearly everything hurtful or dangerous.



A FILTER

Water not to be used too cold

When one is hot or very tired he should not use very cold water too freely. It may cause great pain, inflammation, and even death. Persons with weak stomachs ought never to drink very cold water, cold milk, or other cold fluids, and no one should drink a large quantity at a time. A great opera singer died a few years ago in Paris, in great distress, caused by drinking hastily a large glass of very cold milk. But water that is moderately cool is much pleasanter to drink, and quenches thirst better than that which is warm or tepid. There are many helpful devices for cooling water in hot climates.

Simple devices for cooling water

QUESTIONS

1. What causes a large part of the disease and death in the tropics?
2. How does pure water look?
3. Is water always pure when it is clear and sparkling?
4. What makes water hard?
5. What kind of water is soft?
6. How are some diseases carried in the water?
7. How can we help to keep the water we are to use pure?
8. How can muddy or sandy water be made clearer?
9. How may very cold drink, taken when we are hot or tired, do us harm?

CHAPTER XV

CLOTHING

The uses of clothing

OUR clothing has several very important uses. The first is to keep our bodies properly warm and dry by keeping their heat in, and the chill and dampness of the air out. When the weather is cool our clothing keeps us warm; when the weather is wet it keeps us dry.[1] It also covers and saves our flesh from scratches and hurts; it protects us from the hot rays of the sun, which blister and roughen the skin, make people ill, and sometimes kill them. Our clothing also keeps the dust, dirt, and insects from our skins, so that they shall not become harsh, sore, and unhealthy; and lastly, it covers our nakedness, while it gives opportunity for taste and ornament in dress.

But little clothing needed in the tropics

Of course we need much less clothing in hot climates than in those that are colder, but we need some, and it would often be far better if more and different clothes were worn. Some articles — such as flannel bands for the bowels — which would be great helps to health are very little used, and too little is thought of the proper cleansing and changing of clothes. When people are very poor they cannot buy all the clothes that they and their children need, but they can and should keep clean those that they have, and should follow cleanly habits in wearing them.

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[1] It would be of great help to the people of the tropics in the rainy seasons if the price of the very light waterproof clothing and shoes, so common in the United States, permitted their general use.

Clean clothing and cleanly habits in wearing it possible

What our Clothing does

It keeps the heat in.
It keeps the cold and dampness out.
It saves the flesh from bruises and scratches.
It protects from the hot rays of the sun.
It covers our nakedness.
It gives opportunity for taste and beauty in dress.

Every year a great many children, and many older persons, die in tropical regions because a few simple laws of health as to clothing are not known, or are neglected. One of the very first of these laws is that the lungs, bowels, kidneys, and other vital parts must be kept at an even warmth, — not too hot, and *never* chilled. Dampness and cold together are the great dangers to

Many deaths yearly from improper clothing

Dampness and chill the dangers

Covering needed for the young, weak and feeble

these vital parts. In fogs and damp air the throat, lungs, and feet, especially of very young children and of the weak and sick, need to be covered. A single chill often kills very young children or weak persons; while older people may have from the same cause severe and dangerous throat, lung, bowel, or kidney ills, — pneumonia, diarrhea, dysentery, etc.

A STREET SCENE, WITH NAKED CHILDREN

Many lives might have been saved by proper clothing

We know that many babies and small children in hot countries do not have any clothing from the day they are born until they are eight or ten years old. We also know that a great many thousands die before they are a year old. Many of these might have been saved by a little proper clothing. In hot climates but little more clothing is necessary for the young child, if well and strong, than a light woolen (thin flannel) band, pinned around its body. This will cover the kidneys — which lie close under the flesh at the lower part of the back — and the bowels all around, and this covering they should *always* have.

A light flannel band needed for young children

If the child is weak, it needs more warmth, and its feet and the upper part of the body should be covered. This is also true of weak or sickly older persons. The band, or clothing, covering the vital parts should never be of cotton, for it does not absorb moisture from the body like woolen. When cotton cloth becomes damp it does not readily dry, and the air blowing upon it often chills the parts under it. A light woolen band will be warm even when wet.

CHILD WITH FLANNEL BAND

Many people, young and old, lie down in all sorts of places, sleep on the damp ground, are wet and dry, warm and cold by turns. A light flan-

Lung disease often due to want of clothing

nel band about the bowels, worn night and day, but often changed and washed, would do more to keep them well and prevent disease than any other equally simple thing. Want of proper covering for weak lungs does a great deal to hasten a serious disease (*tuberculosis*) which every year destroys many thousands.

When it is very hot, of course the less clothing one can properly and safely wear, the better; but people living in hot climates suffer and get sick much oftener from too little, than from too much, clothing. There are often sudden changes from very hot and dry, to cool and wet weather, and then, unless the clothing worn next the skin is woolen, — and so is warm even when wet — or unless dry clothing can be quickly had, one is sure to take cold and suffer.

Cover for the head

The heat of the sun can be borne by many, at times, without any cover to the head, but it is not safe to work and travel under the hot sun without a proper hat or cap. While grass, straw, and palm-leaf hats are light and comfortable, they are not safe, unless in some way more thickness is placed between the head and the sun. In India, where it is very hot, thick turbans of light silk, or light, thick pith or straw helmets are worn. In some places, fresh damp green leaves are put into the top of the hat to give thickness without weight, over the head. In some parts of the tropics, wool hats are much worn by *peons* and others, because of their thickness, lightness, softness, and durability, in all kinds of weather. No one is wholly safe from the severe, and often fatal effects of a tropical sun, but proper covering for the head will do a great deal to lessen our danger from it.

Protection for the head

HATS WORN IN THE TROPICS

Most of the light, coarse clothing really needed in hot countries is so cheap that even the very poor usually can have changes of both their under and outer garments. So there is little to prevent frequent change of clothing, or having it clean. In some countries neither the bodies, clothes, or habits of many of the people are at all cleanly. They do not often bathe; their clothes are worn far too long and in very dirty condition, and they have the bad habit of wearing the same clothes day and night, and of sleeping in them in dirty and unfit places.

Greater cleanliness of person and clothing needed

Better laundering needed, with hot water and soap

Too often the clothes when fresh from the laundry, and seeming to be white and clean, have been washed in cold water and with little soap, and are still greasy and grimy. Being too stiffly starched, they are rough and scratch the skin, and often fail to fit, cover, or protect the parts as they ought.

Washing the body and clothes oftener in hot water and with proper soap would greatly benefit both. It would save the clothes, make them far softer and cleaner, prevent disease, and give much more comfort. The necessary fire, soap, and labor would cost something more, but the hot water would take less soap and rubbing. It would save much wear and tear of clothes on the hard stones. It would give cleaner skins, cleaner clothes, greater freedom from vermin and skin-disease, better health, and greater comfort in every way.

What is needed in clothing

The first essential for healthy clothing in hot climates is cleanliness. The next is lightness. The third is warmth, with dryness and lightness. The fourth is protection to the several parts — the head, skin, bowels, feet, etc. Even a very poor hat can be made a very good guard against the sun, by putting a few damp leaves into the top of it. A handkerchief about one's neck in a broiling sun will save the skin from irritation, burns, and sores. A light, dry flannel shirt or undershirt is far more comfortable than a cold, wet, heavy cotton one, and will often save one from colds and fevers. A light flannel band around the body will keep the bowels warm even in wind and chilly rain.

Proper clothing often prevents sickness

Many native people think they need nothing of the kind and laugh at such suggestions for them. But every year many die of the very illnesses that these things would prevent. Many who are not natives — and whose risk is hence the greater — make use of them and are kept from being ill.

Underwear protects and pays

A shirt, or undershirt, dried in a very hot sun will be cleaner, and will sometimes be freed from vermin by the sun bath. Cheap cotton underwear (knit or cloth), though it costs a little money, keeps the skin cleaner, very much lessens the chances of skin diseases (*dhobi itch*, etc.), and pays back in comfort many times more than it costs. Almost any shoes and stockings are better than bare feet. They save from cuts, bruises, and crippled feet, keep off dirt and burrowing insects, and prevent snake-bites and disease.

Shoes and stockings a necessity

One should not wear the same clothing by night and by day

No one can have good health who wears day and night for weeks — whether working, eating, or sleeping — the same stiff, dirty, soaked, and ill-smelling clothes. The clothes one has worn by day should be changed at night for others that are

Dirty clothing often causes sickness

dry and clean, and the working clothes should be dried and aired. Dirty clothing and dirty skins very surely cause ugly and painful skin diseases, bring lice and other vermin. Wet and rough-dried shoes make sore and crippled feet, while dirty, sour, sweaty, and grimy clothes often alone bring on severe sickness.

QUESTIONS

1. What are the most important uses of clothing?
2. How can even the very poor have their clothing most useful?
3. What is one of the first laws of health in our clothing?
4. What harm may come from a single chill?
5. What covering should all young children have, even in the hottest climates?
6. Why is light woolen clothing next the skin better than cotton or linen?
7. How can the head be protected from the heat of the sun?
8. What is the first necessity of clothing in hot climates?
9. What is better than cold water for cleaning our bodies and our clothing?
10. Why should we not wear the same clothing by night as we do by day?

CHAPTER XVI

EXERCISE

If we wish to keep any kind of an engine or machine in good order we work it, so that all the parts will move smoothly and easily. If we do not wish a horse, mule, carabao, or other work animal to get stiff and clumsy we drive or work it every day. Some use or exercise of all the parts of one's body is not only well but necessary to keep them in good and healthy condition. If we did not use our voices we should in time hardly be able to speak. In India, beggars sometimes tie up an arm or leg very tightly. It soon withers from want of use, and they then make it an excuse to beg

A BEGGAR WITH A WITHERED ARM

The need of exercise

money from those who pity them. Air is made better by motion, water is made clear and pure by running fast over rocks. Even the soil is made cleaner, dryer, and better by being dug up and moved about.

Exercise should vary

While exercise is needed for all, the amount and the kind that each person should take must vary with the age, health, habits, food, and usual work of each one. Not enough exercise is as bad for us as too much. The young need more exercise, and more active exercise than the old. Those who are fat, and who eat much and often, need more exercise than the thin and poorly fed. Those who sit at their work, such as bookkeepers, coffee-sorters, cigar-makers, etc., need more than those who move about and use all their muscles.

What should determine the kind, and how much

Any part of one's body that does not get proper exercise in one's usual work or occupation should get it in other ways. A person who sits and studies or writes all day should walk, ride, row a boat, cut wood, work in a garden, or do such things as will bring all parts of the body into active use out of doors. A person who uses only the hands and arms about his work should exercise the muscles of the legs and back in some other way, while one who uses mostly the feet and legs (as a messenger) should rest them and exercise the upper part of the body. Teachers, lawyers, students, writers, etc., should row, fence, walk, box, work in gardens, etc., bringing all their muscles into play in the open air.

EXERCISE SUITED FOR COOL CLIMATES

Less exercise needed in the tropics than in cold countries

Much less active exercise is needed in a hot climate than in colder countries, and when a person is really tired with his day's work he should not make more exertion simply to have a different kind of exercise. Change of work, and a proper division of one's time and labor between different kinds of work, is often the best way to bring all the parts and powers of the body into use.

Excess of exercise is as bad as not enough

One should not work hard all day and get very tired over books or writing, and then get still more weary by walking several miles for the sake of exercise. If he can do less writing or studying, and do some walking or other work, he will in that way give to the different parts of the body, more nearly the amount of exercise each needs.

In tropical countries, the heat and moisture tempt us all to make as little effort as possible, but no one can keep in good health and enjoy life who does not do enough labor, or take enough exercise.

Usually those who are heavy and fat, whose vital powers are weak, and whose muscles are soft from want of exercise, are the ones who most quickly take disease and suffer the most from it.

QUESTIONS

1. How can machines, working animals, and people be kept in best order?
2. What would happen to our voices if we never used them?
3. How do beggars in India sometimes make people pity and help them?
4. What people need most exercise?
5. How can a man who sits and writes all day get most useful exercise?
6. What exercise would be best for a person who used his hands and arms all day?
7. What would be the best exercise for a messenger boy?
8. How can we give the different parts of the body the exercise they need?

CHAPTER XVII

REST AND SLEEP

A VERY tired brain or body does not need exercise — it needs rest. We can rest our limbs and muscles, our arms and legs, our eyes and tongues, by simply keeping them quiet. If we are tired with standing, walking, hoeing, etc., we can sit or lie down.

The need of rest and sleep

If we have been sitting long in one way, it is often a rest to change the way, or to stand up. If the eyes are tired we can shut them, or if our tongues are tired we can stop talking. But when the brain with which we think, or the whole body, is tired and must have rest, we get it best by sleep. We go on breathing, and some other of the wonderful work which goes on all the time inside our bodies keeps on while we sleep. The heart-pump keeps on pumping, the blood flows, the lungs, stomach, bowels, etc., keep at work, though some of them less actively.

Parts of the body work while we sleep

Even the brain, perhaps, does some work, but the whole body is having its best and greatest rest when we sleep. Though some persons seem

Sleep a necessity

to need less sleep than others, every living thing — plants and trees, the lower animals and man — must have some rest and sleep. No greater suffering and misery can come to men than to be kept from getting their proper amounts of sleep; and distress, delirium, and death surely and quickly follow its continued loss.

As with air, water, food, clothing, and exercise, there must be *enough* of rest and sleep. We have seen that exercise ought to be of the kind and amount that each person needs to keep all the parts and powers in good condition. So also there must be rest and sleep enough for each one, and they ought always to be of the right kind.

Even the internal parts rest

The lungs seem to be *always* pumping air, the heart to be pumping blood. But both lungs and heart do really take little, though very short, resting-stops between all their "beats," so that their whole resting-time in every twenty-four hours is enough for their needs.

Change of position and rest of parts a necessity

We usually get our best and most complete rest — when we are not asleep — when we lie down. Partly lying, sitting, leaning, or even changing the way in which we stand or sit, will give much rest. In fact we must often change and move or we shall get stiff, sore, and cramped. The amount and kind of rest we need will depend on whether we are tired in mind or body, and how tired we are.

The amount of sleep and rest needed

We know that sleep brings us our greatest rest and benefit. Infants, or young and growing children, and old people who are getting feeble, need much sleep. Sick persons need a great deal. Much depends upon habit. Some people are born with strong tendencies or likings for much or little sleep. Excitable or nervous people need more than those who are calm and slow in temper and action. Of course, the amount of sleep that we require will depend on how tired or fatigued we are; on whether we have been

A HAMMOCK PROTECTED FROM MOSQUITOES

Not all people need the same amount of sleep losing our usual rest, and whether the drain upon us and the anxiety or fatigue we suffer, has been for a long or short time.

The amount and kind of food or drink we have in the stomach often has much to do with our sleep. A disturbed stomach very much hinders and disturbs sleep, and it is not well to eat heartily just before going to bed.

Good conditions necessary for good sleep

We shall not need as much if the sleep we get is undisturbed and is taken under good conditions. When sleep is broken in upon, as it often is by noise, light, insects, etc., it does not so much refresh us. A soft, clean bed or resting-place, a comfortable bunk or hammock, is sure to bring us better rest and sleep than a very hard, dirty, ill-smelling cot, or mat upon the floor. In the tropics there is need of great improvement in the ways and means of rest and sleep. One cannot get the best rest or sleep upon too hard surfaces, such as dirt, stone, or wood floors. These bruise and tire the muscles, and press hard upon the bones.

Good beds essential

Beds with some kind of springs and which have a little softness, such as that given by well-made — even if thin — mattresses, give much the best rest to back and limbs, and allow the best sleep.

Really good beds are very scarce in all tropical climates, though plenty of good materials to make them with are almost everywhere to be had. Good hammocks can generally be easily got or made.

Conditions for good sleep very bad in the tropics

Blankets, sheets, coverlets, etc., which are dirty, stiff, hard, rough, or wrinkled, do not permit comfortable rest or refreshing sleep. A clean, cool, soft, and comfortable bed invites it. In nearly all tropical countries sleep is often disturbed by animals and by insects. It is often made restless by heat, smoke, and close and stifling air. Proper care and forethought can often reduce annoyance from these sources.

Importance of rest and sleep

Nearly one third of our lives is usually spent in rest and sleep, and from these we get a great part of our power to do and to enjoy. When we are sick we are often kept in our beds for days or weeks at a time. How much we then need good, clean beds, in clean and quiet places! Is it not well worth our best efforts to have them, and the places for them, what they ought to be?

Protection from insects

A cheap mosquito netting over a bed will often make the difference between a night of delightful and strengthening sleep, and a night of wretched sleeplessness and discomfort. This would mean much to a well person; to a sick woman or child, or a man suffering with a broken leg, how much more!

A mid-day rest wise

When the heat is so great in the middle of the day that all labor is difficult and disagreeable, one does well to take mid-day rest, doing the most of his work early and late. One is always so little inclined to labor where it is hot, that it is easy to call laziness fatigue. Indolence is not rest, and we should take rest and sleep so that we may work the easier and better in hours in which we ought to be active.

COT WITH MOSQUITO NETTING

QUESTIONS

1. What does a tired brain or body need?
2. How do we get the best rest?
3. What would follow the continued loss of sleep?
4. How much sleep and rest do we need?
5. What people need more sleep than others?

6. On what does the amount of sleep we need depend?
7. What things often disturb our sleep?
8. Why can we not rest well on a hard bed?
9. How large a part of our lives is usually spent in sleep?
10. What things can be easily done to make us sleep better?

CHAPTER XVIII

PERSONAL HABITS AFFECTING HEALTH

Neglect in personal habits

Many things which persons do so often and so commonly that they are called their habits, have a great deal to do with their health. Among the worst habits are those of neglect. There are some things that we ought to do, which if attended to as they should be, would become good habits, and do much for our health, comfort, and happiness.

AIDS TO GOOD HABITS

Some of the habits which affect health in the tropics are common to all the people, while others are personal only. When persons make free use of tobacco or intoxicating drinks, or chew betel nuts or opium, or, neglect to clean their teeth or nails, or to bathe, they have bad and hurtful habits. To clean the teeth and nails,

Good habits

and to bathe often, and to properly care for the bowels, hair, and skin, is to have good and helpful hygienic habits.

There are some parts of our bodies, such as the bladder, bowels, and stomach, which must be cared for often, or they will soon get out of order. Some things we must do for them, or we shall soon suffer and get sick. There are also things we must not get into the habit of doing, — such as abusing our powers, inhaling tobacco-smoke, straining the eyes, etc., or we shall lose health and be wretched.

Care of the hair and scalp

The hair, and the scalp from which it grows, should be well brushed every day, and be kept free from dirt and grease. If the hair of men and boys is trimmed often it will very much aid in this. In hot countries it should always be worn short, as long hair increases the heat of the head and neck, gets damp, dries slowly, and often causes one to take cold. The hair and scalp should be often thoroughly washed with hot water and good soap, and well rubbed.

Care of the eyes

The care of our eyes is very important in the tropics, where thousands are made blind by neglect and the effects of diseases (*ophthalmia*, etc.) which could largely be prevented. We must avoid the habit of straining our eyes in trying to read, write, sew, or do other work in a bad light, or in smoky places. The glare of the sun and the great moisture are also bad for the eyes and call for wide hat-brims and colored glasses. Bathing the eyes often in hot water is helpful, but cold water should not be freely used upon them. Every year many eyes are ruined which might have been saved by greater cleanliness, care, and the early help of a doctor. Any trouble with one's eyes should have prompt medical care, but proper use and care for them will often prevent such trouble.

Care of the ears

Our ears need good care in hot countries, as dirt, hairs, insects, etc., very often get into them and need to be removed. But though we must wash them often, we should not let water get into them, as it hurts the hearing, and if one is to plunge the head under water, as in swimming, both ears should be filled with cotton. Sometimes when an insect gets into one's ear — as often happens where insects are so abundant — it cannot be got out and gives great pain. If the ear is filled with oil, the insect will die at once and can then be removed. Children must not be allowed to put things like beans or peas into their ears, as serious trouble often follows, and the ears should never have holes made in them and rings worn in them. Blows upon the ears, or cold air blowing into them, are hurtful.

Care of the nose

Every one should learn the habit of breathing through the nose, which should have daily care and be kept free of all dust, dirt, dried blood, and mucus. The habit of piercing the nose and hanging a ring in it for ornament belongs only to savages.

Care of the teeth

The daily habit of taking good care of the teeth and gums should be learned early. The teeth decay quickly if acids or bits of food are left on them after eating, and should be carefully brushed and cleaned, with plenty of water, after each meal.

The use of the betel nut (*pinang*) with quicklime, as a stimulant, both blackens the teeth and tends to destroy them. The habit of chewing tobacco is also very bad for the teeth, and the juices of both tobacco and the betel nut interfere very much with the digestive powers of the saliva in the mouth and stomach.

PERFECT TEETH

Care of the hands and feet

Every one should learn the habit of taking good care of the hands and feet, for they are our very useful servants. They should daily be washed and scrubbed with soap and water, and as often as they become dirty. The nails should be kept soft, clean, and well-trimmed. Neglect often means large joints, brittle and broken nails, sore and crippled feet, rough skins, and painful and destructive diseases. *Dirt alone* is the cause of certain very annoying skin diseases, and brings certain very troublesome insects to both hands and feet. Clean hands and well-kept finger-nails are a credit to every boy and girl.

Care of the bowels, etc.

Much of the waste of our bodies, as we have seen, passes into our bowels, and as it changes fast (ferments) and grows foul and acid, it should be passed out of the bowels at least once a day, and the waste of the kidneys (the urine) should be very often removed. This should be a carefully followed habit of every one, and will do much to keep us in good health. In most tropical countries the want of proper conveniences for these needs of the body is one of the chief causes of disease. Every effort should be made to remedy these defects in the ways suggested in Chapter XIX on *Home and Domestic Conditions.*

Care of the skin

The care of the skin is of great importance to health, and the habit of bathing often is of the highest value. Frequent bathing, especially with hot water and proper soaps, will do more than anything else to increase the comfort and health of the people, or will do as much to free them from vermin, many severe skin troubles, and such terrible diseases as *elephantiasis*, *leprosy*, *dhobi itch*, etc. The skin constantly throws out so much greasy sweat (perspiration) that the use of cold water without soap will not wholly cleanse it. Yet a cold bath, if taken often — even if but little water is used — and followed by hard rubbing with a coarse towel, will keep the skin in good order and greatly improve the health and comfort.

GOOD BATH TUB
Water can be heated in fifteen minutes with gasolene flame

Bay-rum, or common rum, when used in bathing are great aids to cleanliness and the health of the skin. A little carbonate of soda in a foot bath, takes away the odor of the feet. Bathing in clean ponds and streams is healthful. Sea bathing is especially invigorating and a great aid in preserving health in hot climates.

Habits in eating

To keep up the best health we must not only have *enough* to eat and drink, but we must have the habit of eating and drinking at the right times, at about the same times daily, and in the right manner. To eat slowly, to chew our food well, and to eat and drink no more than we need, are nearly as important as to have enough pure food and drink. Common disorders of the stomach are quite as often caused by bad habits in eating and drinking as by what we eat and drink.

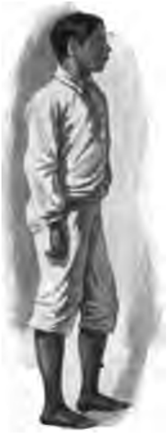
SEA BATHING

Habits in standing, sitting, etc.

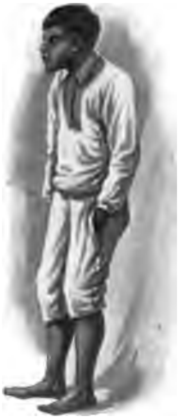
Young people must not get the habit of standing or sitting in stooped, cramped, or awkward positions. If we sit or walk bent over, with our shoulders thrown forward, we cramp the lungs and make it more difficult to breathe, and press upon and hurt the stomach. If we wear too tight belts or shoes, we cramp our bowels or our feet, hinder the blood from flowing freely, and press the parts out of shape.

Drinking and smoking

The habit of using alcoholic or malt liquors is at best a dangerous one, especially so in hot climates, and is often sadly abused. Liquors should be used only with great care and moderation, and never by the very young. Beer, wine, and spirituous liquors, if used as tonics, food, or beverages should always be drunk or sipped slowly, never swallowed at a gulp, as is so often done. They do least harm when taken with food. Their use to excess is destructive of the powers of body and mind, and causes many diseases, especially of the liver, kidneys, heart, and brain.



GOOD POSITION



BAD POSITION

Tobacco should not be used by the young

Tobacco should be smoked only with moderation by adults, and never by young and growing persons. A weak heart and other troubles follow excess. With the young, smoking dwarfs the growth, and the narcotic effects are very bad. The smoke should *never* be drawn into the lungs, and spitting should be avoided. The habit of constantly smoking cigarettes and inhaling the smoke is one that will surely do harm. It is especially hurtful to the young, as is also the chewing of tobacco, clay, or resinous gum.

AN UNDESIRABLE POSITION

The habits which are to be most carefully followed, always and in all things, in the tropics, are *cleanliness* and *moderation*.

QUESTIONS

1. What are habits?
2. What bad habits can you mention?
3. How should the hair and scalp be cared for?
4. How can we prevent harm to our eyes?

5. Can you give some rules for the care of the ears?
6. Why should the teeth be kept clean?
7. How do the chewing of tobacco and the betel nut injure the health?
8. How often should the waste of the body be removed from the bowels?
9. What is one of the most important of the good habits for warm countries?
10. How do bad habits in eating and drinking injure our health?
11. What is the effect of alcohol and tobacco on young people?

CHAPTER XIX

HOME AND DOMESTIC CONDITIONS

Young people able to make homes better

YOUNG persons are usually very much what their homes make them, but they can often do a great deal to help make their homes what they should be. If homes and their surroundings, whether in town or country, are neat, clean, and orderly, those who live in them are likely to be so.

SAN JUAN PALACE, PORTO RICO

In some *cities and towns* in the tropical parts of the United States, and in other countries, the

Homes cannot be clean if surroundings are not

streets, alleys, and other surroundings of the dwellings are fairly clean and well kept, but in most places they are very bad. It is of little use to make a house clean, if the conditions about it are filthy, and dirty people and dirty animals are often running in and out.

NIPA HUTS, PHILIPPINES

City and town conditions vary greatly

The dwellings and their surroundings in the cities and larger towns vary greatly — from the tiled marble palaces to the grass-thatched huts of nipa, or palm bark, and from the rows of three-story buildings, swarming with old and young, to the little cabins on the edges of the towns. Therefore the same rules of hygiene will not equally fit them all.

Some dangers to health greater in towns than in the country

Some things that are very bad about the large, crowded, and dirty buildings in some of the cities, cannot be wholly changed without tearing down the buildings. We can only improve their unhealthy conditions. The poisons and impurities of air, water, food, and soil are more and worse in towns than in the open country.

STREET IN SANTIAGO, CUBA

Conditions can be much improved

Much that persons or families could do in the country to improve their health conditions must be left in the cities to those in charge of the public health. But all can do something, chiefly by keeping themselves and everything about them as clean as they can.

Most of the impurities and poisons of air and

Impure surroundings in cities and towns

soil in the home surroundings of large places come from the foul gutters, ill-paved and ill-kept streets; the vile pits, drains, and cesspools beneath the houses, and the dirty, mouldy, and filth-soaked spaces about the dwellings. Sewers, catch-pits, and gas-pipes often add their dangerous vapors and stenches. The decaying waste and house-refuse — often thrown into the streets and alleys — and the dirt of stables, factories, and work-shops, are great evils. Even in large towns, many trees and too much vegetation often cause unhealthy dampness and fungus-growths about the houses.

ON THE ROAD TO PONCE PORT

Water supply

Where the water supply of families is drawn from wells or cisterns in such soil, as in cities and towns not having public water-works, sickness and death are frequent from the use of the water.

Methods of water removal better but not safe

Better means of taking away waste by public sanitary methods and improved apparatus, and by sewers, as well as better water supplies, are found in some chief places. Even these have their own dangers, and great care must be taken in their use, to prevent disease.

Means of improving bad surroundings in cities

To overcome the dangers of these bad *surroundings*, we must clean out and disinfect the foul gutters; we must take the vile pits, drains, and cesspools from under and about the houses wherever possible; and we must often empty and disinfect those that we cannot remove. All dirty, mouldy, and filth-soaked spaces about dwellings must be cleaned up, drained, and disinfected with lime. Where there are sewers and catch-pits, plenty of fresh air, clean water, and disinfectants must be often let into them. The decaying house-refuse, garbage, etc., must be kept out of the streets and alleys and properly cared for.

Few stables should be allowed in closely-built parts of towns. The fumes and dirt of factories should be prevented by those who make them, and by the health authorities. Where dampness and mould gather from too heavy vegetation about the houses, the trees and shrubs should be cut away, air and sunlight should be let in, and the ground drained.

STREET CLEANING, SAN JUAN

The first steps necessary

The first steps toward healthy houses, in all populous places, must be to get a good water supply, to keep the air and soil under and around dwellings as clean and dry as we can, and to keep them free from all decaying matter and insect life.

The dangers to homes in cities

There are many dangers to health *in* the homes and their domestic conditions, in the tropical towns. The better, large buildings usually have two or three floors, and are deep and narrow. We know that in some of them, with foul surroundings, built with little care for light, air, decency, comfort, or safety, disease and death are always busy.

Bad conditions

The many rooms, the stairways, and corridors, are usually reached only through one common doorway. Ill-smelling merchandise is often piled in the lower courts. The roofs are often leaky. The little light and air which enter must do so through the few end windows, and the courts (*patios*) in the centre. The floors are often damp and dirty. The rooms are small, dark, dirty, and unventilated. Smoke, steam, and gases from all kinds of cooking, fill the air. Dirt is thick everywhere.

Young and old are crowded into these dark and dirty rooms, from which, at night, all fresh air is carefully shut out. One breathes constantly the odors of filth, cesspools, and refuse of all kinds. The sanitary and kitchen conveniences are very bad and usually close to each other. Decency, privacy, clean meals, quiet, rest, baths, clean rooms, or clothing, are little known. Pure water, cheap fuel, good lights, and clean utensils are difficult to get. Hot water and soap are often hard to get. A soft, clean bed, free from fleas and mosquitoes, in a quiet, well-aired room, is not often seen. Too often the hard, dirty floor is the bed, and the damp and dirty clothing worn by day the only covering. The crowded floor space and foul air are often shared by dogs, cats, and other pets. The filters and water-jars are dirty and are green with mossy growths.

Many sources of discomfort and danger

The children are pale and dirty, their eyes and skins often being diseased. Their elders are in little better condition. Bad habits of all kinds, and neglect of good ones, surely go with these bad sanitary conditions. Thousands, as we know, live in this way, in the thickly settled tropical cities and larger towns, and breed disease of all kinds, for themselves and others. In the smaller and less crowded buildings and better homes, the hygienic conditions are sometimes not so bad. In some of the detached houses, and the homes of the educated and wealthy, they are much better — especially in the matters of food, cooking, beds, clothing, and general cleanliness — but very few are free from many neglects, impurities, and grave dangers to health. But the people themselves hold in their own hands the remedies for most of them.

The remedies in our own hands

To remedy the sanitary defects in the homes and domestic conditions of our tropical cities and towns, we must, so far as we can, simply put good things in the places of the bad.

The remedies

If we cannot get better buildings in place of those we now have, we must improve those that we have as much as we can. First of all, we must let in, wherever possible, *more sunlight and air*. More windows and better air-openings should be put in, and leaky roofs and conductors should be made water-tight. Everything must be made and kept as clean as the frequent use of water, soap, lime-wash, and disinfectants will do it.

More light and air

Lesser crowding

We must stop crowding so many persons, young and old, into small, unventilated rooms, with less than half the air each one ought to have. We must stop shutting out the fresh air at night, and every one should be taught to live as much as possible out of doors. Better floors should be laid, and clean sand or sawdust should be often sprinkled over them, when there are no mats, rugs, or carpets upon them. Mattings, which are easily taken up and cleaned, are great helps to health and comfort.

Better means for fires

More and better chimney-flues and fireplaces, gas or oil stoves (where they and their supplies can be had), would greatly lessen smoke and gases. They would give better air, better arrangements for cooking, hot water and baths, and permit cleaner bodies, clothing, rooms, and utensils. They would also greatly lessen the cases of eye and skin diseases.

As a prime need good wells and cisterns, in clean soil, or an aqueduct supply, must take the place of impure water, and only clean, well-kept filters, net-covered water-jars, and *boiled water* should be in use.

Better water

A GOOD BATH ROOM IN A GOOD HOUSE

Decent water-closets and sanitary conveniences, well ventilated and decently kept, placed as far as possible from kitchens, must take the place of the foul ones so commonly in use. Rooms, partitions, screens, etc., that will permit privacy

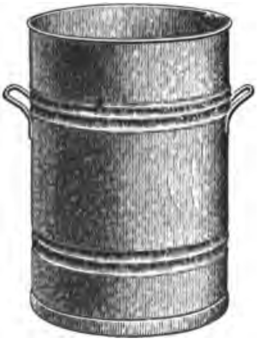
Better water-closets, etc.

for baths, dressing, rest, and sickness, must be provided.

Better beds, etc.

Better beds, clean bed-clothing, and mosquito-nets are much needed. A poor bed, a grass hammock, or even a grass mat upon a clean floor, would be much better than those too often in use. Nothing gives back more for the money spent upon it than a good bed. An iron bedstead, a cheap spring, a thin mattress, a good mosquito net, and clean, light bed-clothing — with a clean skin — will do much to insure good sleep, and nothing means more to health than good sleep. All bed-clothing should be well aired every day, and often laid in the sun.

There must be tightly-covered cans or barrels for all house-refuse, which must be often emptied, cleansed, and disinfected. Leaky gas and sewer pipes must be repaired. Better lights must take the place of dim, smoky, and greasy ones. More care, and the better means and apparatus now so easily had, must be used for the keeping of fresh meats, fish, milk, and other food.


ASH CAN

By the use of proper means, most of the troublesome vermin and insects which abound in

To be rid of insects, etc.

tropical homes can be destroyed. Rats, which are believed to carry the bubonic plague and other diseases, can be exterminated by ferrets, traps, poisons, etc. Centipedes, roaches, ants, fleas, lice, mosquitoes, etc., have each their remedy, and most of them can be driven out of a home where persistent war is made upon them.

FERRET

We can keep clean in the cities

With better conditions for health and comfort in the home, good habits of eating and drinking, bathing, personal care, clothing, etc., are made easier and more attractive. Though the country may be better for health, we *can* keep clean in the town, and *to keep clean is to go a long way toward keeping well.*

QUESTIONS

1. What dangers to health are greater in towns and cities than in the country?
2. From what causes do most of the poisons in the air and soil of the larger places come?
3. Why is the water in wells and cisterns worse in the towns than in the country?
4. What must be the first steps toward having healthy houses in populous places?

5. How do the unhealthy conditions in city homes affect the children?
6. To remedy the defects in these homes what must be put in place of the bad things?
7. What are the first good things to be let in?
8. How can the water from impure wells be made less hurtful?
9. How should the house refuse be cared for?
10. How can we go a long way toward keeping well?

CHAPTER XX

HOME AND DOMESTIC CONDITIONS (*continued*)

Most people in the country

By far the greater part of the people in tropical regions live in the country. The great needs of all classes there are better houses; enough pure air; good food; pure water; dry, clean soil; cheap fuel, and general *cleanliness*.

Our Chief Needs

Better Homes.
Enough pure Air.
Enough pure Water.
Enough good Food.
Dry, clean Soil.
Cheap Fuel.
Good Habits.
General Cleanliness.

The chief evils much the same as in towns

The chief enemies of health in the country are much the same impurities of air, water, food, soil, and clothing, and the same bad habits we have noticed in the cities and towns. A few — such as the poisons of air in mines, some animal diseases, etc. — belong to the country only. Others — like dampness, water-pollutions, insects, etc. — are more common or active there, while others

— such as "trade" and food poisons — are less so.

The unhealthy *surroundings* of tropical *country* homes are many. They are chiefly: —

The unhealthy home surroundings

Too many trees, shrubs, etc., about the house, and the too much shade, moisture, etc., which they always bring;

Too much dampness of the soil; dirty pools of water; and choked, foul, and wet ditches;

Filth (*excreta*) and refuse thrown upon the ground or buried about the houses;

Impurities in the streams, springs, wells, etc., that furnish the water supply, and

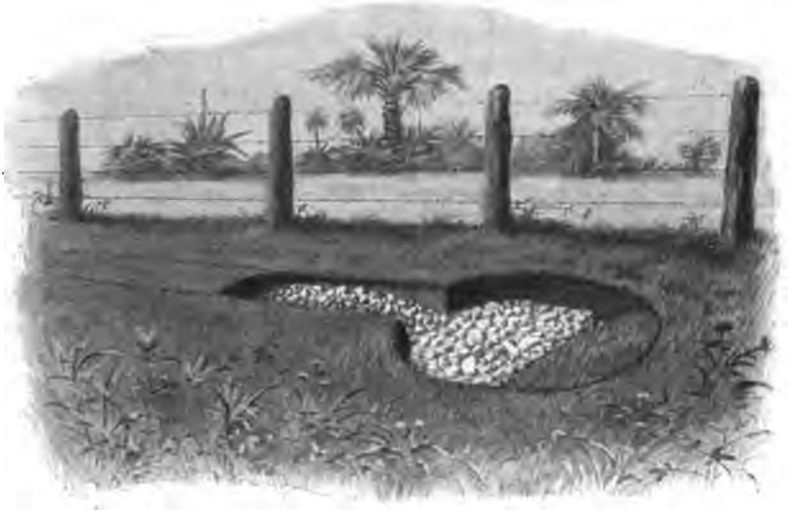
Stablès, pens, and domestic animals about the houses, wells, etc.

To remedy these sanitary defects and dangers of these surroundings: —

We must cut away or trim up the overhanging trees and rank grass about each house, and make sure that the sun can shine in, and the breezes blow here and there. If this were done, much of the dampness, sourness, and mould would soon disappear, and insects, reptiles, etc., would be fewer.

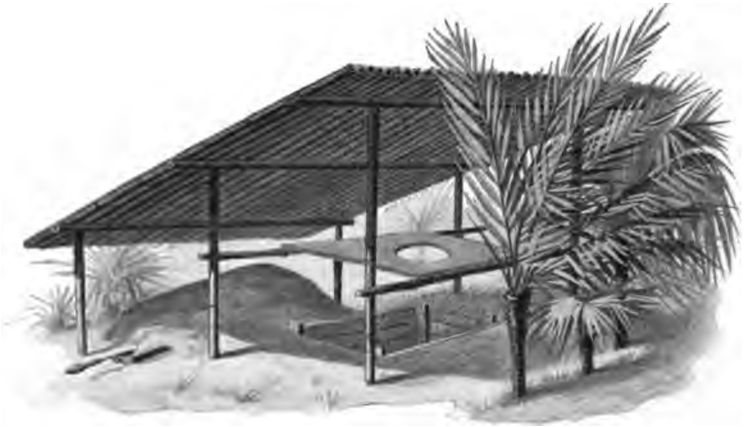
The remedies for the unhealthy surroundings

We must drain and dry the soil. If ditches were cut about each house and led to some low place away from it, and these were filled with stones and covered with earth, the ground under and about the house would soon be drained and dried.



A BLIND DRAIN AND WELL

We must stop throwing filth and house-refuse upon the ground, or into streams, or burying it in the soil about our homes. The greatest sanitary need of all tropical peoples, even in the best homes, is that of clean and proper places where they may be rid of the waste of the body. In the country these should be a little away from the house, over pits properly built, covered and screened, easily reached in bad weather or by night. If such pits are used and freely covered with earth, emptied often, and disinfected with lime, a chief cause of discomfort and disease will be in large part removed.



PIT, WITH SEAT, SHELTER, AND PILE OF DRY EARTH

Animals should not be kept near the house

We must not keep horses, cattle, goats, pigs, or poultry, near our houses if we wish to have the ground about them clean and dry. In no other way can we be free from foul smells, dirt, and perhaps the germs of disease. If the pigs and poultry are kept away from the house, and their dirty "wallows" and burrows filled up, there will be much less filth and fewer mosquitoes and other pests.

We must keep filth and refuse of all kinds out of streams, springs, ditches, etc. A foul or stagnant pool, ditch, or stream near a house always breeds insects, odors, and sometimes sickness.

Fruit trees, shade trees — like the blue-gum tree (*eucalyptus*) — and small flower and vegetable gardens, help to make the soil clean and dry, beside giving pleasure and profit in the home surroundings.

The hygienic defects in country homes

The sanitary defects in the country homes and domestic conditions of the tropics are also many. Though there are some large and comfortable homes, and many good and well-built houses, hardly one is free from grave sanitary defects and dangers to health and life. The greater number of these are in the houses of the very poor, whose health is about all they have. No matter what their size, or how well they are built, the houses are rarely large enough for the numbers who try to live in them.

Many huts are not fit to live in

Often the poorest huts are built on the ground, with only the earth for a floor. Even if raised a little, it is only enough to allow the hogs and hens to burrow beneath, and the loose floor lets all the dampness and odors of the ground into the cabin above. Their thatched or bark-covered roofs, usually loosely covered with bamboo, boards, nipa, or the bark of the royal palm, are often cracked with the heat, sodden and mouldy with the long rains, and foul with the smoke, fumes, and stenches of charcoal fires and frying food.

BAD COUNTRY "SHACKS"
These have no chimney and little ventilation

Light and ventilation needful

In the poorer huts there are often no chimneys or fireplaces, or but very poor ones, and even the better cabins have few cooking conveniences and little fuel. Little sunlight gets in by day, and at night — as in the city houses — no air is let in that can be kept out, every door and shutter being tightly closed, even in hottest weather, through fear of night air. Ventilation is a thing not thought of. In most of the poorer huts and cabins there is but a single room. Partitions and screens are little known.

Even in the better cabins and homes there is too little privacy, or opportunity for bathing, care of the sick, etc. The want of kitchen conveniences, the scarcity of fuel, and sometimes even of soap and water, make dirty bodies, food, beds, clothing, and utensils far too common.

The hygienic defects (continued)

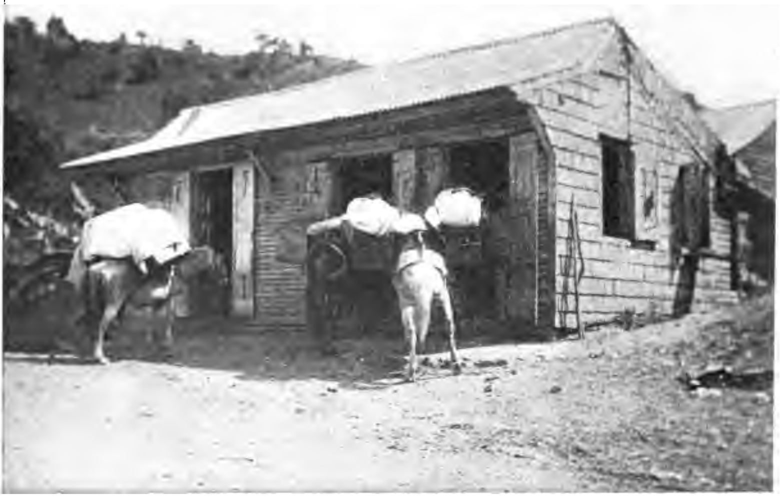
Nothing could be worse than the usual sleeping arrangements of the poor, and even those of the better classes are not often good. The dirty floor, or a hard and dirty bed, is the common lot. Dogs and other domestic animals, even goats, pigs, and poultry, sometimes share the tightly-shut huts at night.

The lights are usually very poor, mostly candles, with a few oil lamps — though little use is made of them.

The waste of the body and the house-refuse are generally thrown upon the ground — dogs, pigs, and poultry being the only scavengers.

There is no fit place to keep food, and too often there is not much to keep. Little care is taken to keep it clean or free from insects, or to prepare it well. Milk, meat, fish, bread, and vegetables are often eaten when unfit for food and sure to do harm.

Water, which surely in the country ought to be kept clean and pure, is often, from neglect or want of a little effort, allowed to become dirty and dangerous to health. For this there is no excuse, and such neglect must pay its penalty. Where there are filters and water-jars, they are not often cleaned, and mould and other vegetable growths usually cover them.



A HOUSE AND SHOP UNDER ONE ROOF

The building is too near the ground and has no chimney

Reptiles, vermin, and insects often infest the houses, beds, and the bodies of the people and their domestic animals. Fleas, centipedes, lice, ticks, ants, and mosquitoes everywhere cause discomfort and some, we know, carry disease.

Under such conditions we cannot expect to find clean habits in eating, drinking, clothing, the care of the body, etc.

Every one can help remedy the defects

Yet bad as these defects and dangers are, there are but few of them that cannot be helped by a little care and effort on the part of each man and woman, boy and girl.

Make it dry under the house

We must make the house itself more nearly what it ought to be. If it is set upon posts high enough to let the air blow freely under and the dampness to dry out, or if it is placed on a well-drained hillock, instead of in a hollow, much will have been done to promote health.

More air necessary

We must not put too many people into it for its size. We must have doors, windows, and air-openings enough to give those who live in it plenty of sunlight and air. There is nothing more necessary to be learned in the tropics than that *the fresh air must not be shut out of our houses at night* if we wish to keep health.

The floors

We must have good tight floors. A good result of raising the house, is that it prevents using the ground for a floor, as this is never fit to live upon. Clean, dry sand sprinkled daily on the floors of the poorest cabin does much to help cleanliness, especially in wet weather.

The roof

The roof must be well covered. If we thatch it, we must keep the thatch tight, so that the house will be dry. We must have in it places to let out the smoke, gases, and smells from below, so that it will not be dirty, damp, and sour. The thatch should often be made new. A better roof will soon pay for itself, and good shingles will outlast many new thatches.

Better fireplaces, etc.

We must have proper chimney-places for fires and cooking. No one is too poor to have a little shed behind the house, in which to cook and wash, and so keep the smoke, gas, ashes, and steam out of the house. Wood or charcoal fires should never be built in houses or huts that have no chimneys for the smoke. In the better houses there can easily be better conveniences for cooking, laundering, etc., such as chimneys, fireplaces, oil-stoves, utensils, etc.

Hot water a great need

A small kettle kept filled with water, a cheap oil-stove, and a few cents' worth of coal-oil a day, will give a family enough hot water for its kitchen needs and some for baths. Even a very poor family can have these. With hot water, soap, and the help of borax, ammonia, or some of the cheap cleansing powders, there need be no more greasy frying-pans or other kitchen utensils, or dirty clothes. Good tubs are much better and cheaper for washing clothes than dirty streams or pools. Scrubbing boards save clothes and are much better than hard stones.

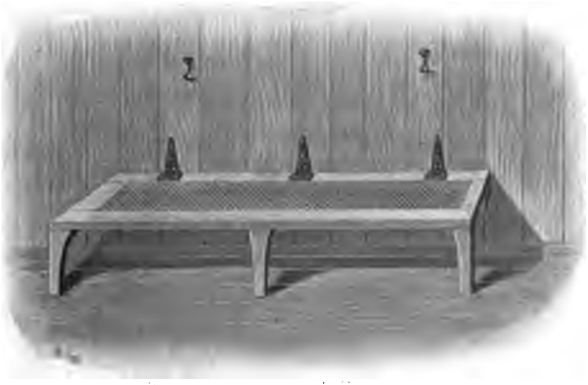
Plenty of hot water means also cleaner and healthier houses and clothing, better food, better bathing-habits, and far better health. No one thing will do more for the health and comfort of every person in hot climates, in country or city, than daily cold bathing and an occasional hot bath. A large proportion of the eye diseases and skin diseases which afflict so many in the tropics can often be greatly helped, and sometimes cured, by the free use of hot water.

More privacy for baths, etc.

We must have for health, comfort, cleanliness, and decency more chance for privacy in homes, more rooms, partitions, screens, etc., so that the old and sick can be separated, and can sleep, bathe, dress, etc., in quiet, and away from others.

Better beds needed

We must make the beds and the places for rest and sleep much better. Grass mats make clean (though hard) beds. Hammocks make clean, comfortable, and healthy ones, and both are easily



A HINGED BED FRAME

made and cheap enough for all. Bed-frames covered with wire, and grass mats, hinged to the wall and turned up against it by day, to give more floor-room, make good, clean beds and are easily made.

The cheap iron bedsteads with springs and thin mattresses are always best and pay back in health and comfort many times their cost. So little bed covering is needed in hot climates that it should surely be kept free from both dirt and vermin. Every bed and hammock should have a mosquito net over it and nothing of so little cost will do as much for health and comfort. Even the poorly-fed would do well to save enough from food to buy its protection from discomfort and disease.

Better lights

We must have better lights — if only to save eyesight. The cheap coal-oil and the many good cheap lamps now easily had, bring better lights within the reach of all.

Better care of house-waste

We must take better care of all house-waste in tightly-covered boxes or barrels, which must be often emptied and well cleaned, so that they may not gather insects, or cause bad odors and sickness. All waste of the body must be cared for in the outside pits spoken of before.

Better keeping of food

We must have in every home (where ice cannot be had) a dry, clean closet, on legs, in which to keep food. It should be as far as possible away from light, dust, and heat. It should be covered with netting, and its legs should be set in cups of oil to keep out insects, etc. If meat, fish, and other foods are carefully cleaned, wrapped, etc., as has been suggested (see Appendix), and are so kept, they will keep fresh and sweet much longer than when neglected. Such care of food will do much for health.

Care of food

LATRINE

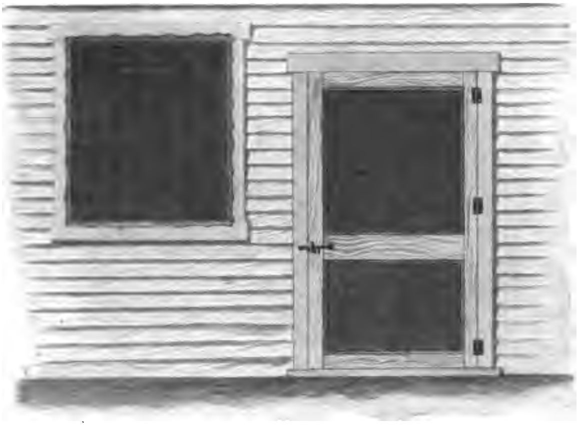
Filters, water-jars, pails, etc., must be sometimes changed and carefully cleaned in hot water, and all water used for cooking or drinking *must be boiled.* By no other means can so many dangers which come from food and drink in the tropics be so safely guarded against. This is no less necessary in the country than in towns. It must be every one's duty, always and every-

Better care of filters, water-jars, etc.

where, to keep every kind of impurity out of any and all sources of water supply.

Prevention of insects, etc.

We must, as a matter of first importance, keep insects, reptiles, etc., out of the house. Although there are so many of all kinds in hot climates, the greater part of them can be kept out at but little expense, if some care is taken. Cheap nettings everywhere, over doors and windows, and the free use of the germicides and insect powders, some of which are good, will keep out and kill off the larger part of the flies, fleas, mosquitoes, roaches, ants, etc. If the walls of huts and houses are often lime-washed it will do much to destroy the eggs of flies and other insects.



HOW TO USE MOSQUITO NETTING

Mosquito nettings, etc.

Good habits in eating, drinking, bathing, the care of one's person, etc., are more easily followed and more likely to be acquired, when the aids to them are at hand in our homes.

Better habits with better homes

FINAL WORD

If we live right we shall be well

Let the light and air into every corner of the home. Keep the house dry and clean. Keep out bad air, and let out the impurities you make. Keep food and drink pure, and cook them well. Get rid of the waste. Keep out domestic animals, vermin, and insects. Have good beds, clean clothing, clean bodies, clean thoughts, and good habits. By these means you will drive out disease and bring comfort and health to your homes.

QUESTIONS

1. What are the great needs of the people who live in the country?
2. What are some of the unhealthy surroundings of country homes?
3. How can we get rid of some of the dampness in the homes?
4. How can the soil about the house be drained and dried?
5. How can one of the chief causes of disease and discomfort be removed?
6. What is the effect of stagnant pools and ditches near a house?
7. What are some of the bad conditions inside the homes?
8. How can they be helped?
9. Is it well to have the house built directly upon the ground?

10. What must we do to have plenty of sunlight and air in the houses?
11. How can we keep the house dry in wet weather?
12. What are some of the good uses we can make of hot water?
13. How can the beds and sleeping-places be made better?
14. How can food be better kept and insects be kept out of it?
15. How should the water-jars be cared for?
16. Can you tell some or all of the things mentioned in the "Final Word" by which you can drive out disease and bring comfort and health to the homes?

THREE CHIQUITA SCHOOL GIRLS

SCHOOL-ROOM EXPERIMENTS

AIR

To find how often the air of any room should be changed.

1. FIND how long, how wide, and how high the room you are in is. Multiply the length, width, and height together to get the number of cubic feet of air there are in the room. Count the number of persons in the room. Find how many feet of air there are for each person. See how many times you must change the air in an hour to give each person 2000 or 3000 cubic feet of fresh air every hour.

To show that what is breathed out of the lungs makes air unfit to breathe.

2. Breathe for a minute through a tube or straw into a tightly corked deep bottle or jar. Lower a piece of lighted candle into the jar by a string or wire. The flame will not burn, showing that the air is too impure to give the flame oxygen enough to let it burn.

To show the moisture in the breath.

3. Breathe into a cold tumbler, or upon the cold glass of a pair of eye-glasses. The glass will be dimmed at once by the moisture (water) thrown out of the lungs.

To show the carbonic acid gas in the breath.

4. Make some lime water by putting a piece of fresh, dry lime as large as a hen's egg into a quart of pure water, and letting it stand (covered) for twenty-four hours, when the clear water should be carefully poured off. Pour about two tablespoonfuls of lime water into a tumbler and breathe into it through a straw or a glass tube.

The lime water will at once become milky from the carbonic acid gas in the breath combining with the lime in the water.

To show how much good a filter does in cleansing water.

3. Take three small flower-pots (with holes in them) which will fit tightly into each other, and leave some room between the bottom of the upper one and the one next below. Fill the open space in the lower one with finely crushed charcoal, fill the open space in the middle one with small pieces of sponge packed in tightly. Fit the three flower-pots tightly together and fill the upper one with dirty water, putting a tumbler under the lower one. Set the pots in a frame to hold them up. The dirty water will go through the hole in the bottom of the first, into the sponge packed in the second, and through it and the hole in the bottom into the charcoal in the lower one, and will come out into the tumbler quite clean.

WATER

Hard or soft water.

1. Water is said to be "hard" or "soft," as much or little soap is needed with it to make "soap-suds," or "lather." Take a basin of water into which lime or magnesia has been stirred, and show how much more soap it takes to make "suds" or "lather" with it than it does with a basin of clean rain water.

To show whether there is sewage or other foul (organic) matter in water.

2. Take a clean bottle holding about two ounces, and fill it with the water you wish to test. Put into it a small lump of pure white (refined) sugar. Cork the bottle tightly and put it away in a warm place. If the water in a few days becomes thick, milky, or cloudy, it is not fit for cooking or drinking.

FOOD

To show that food contains starch.

1. Take bread, potatoes, rice, or any food containing starch, and drop on it a few drops of tincture of iodine (to be had at any apothecary's), and it will turn blue wherever the iodine touches the starch.

To show how some things ought not to be put together in food or medicine.

2. Let a few iron filings or a piece of iron lie for a week in a cup half full of vinegar. Take a teaspoonful of this vinegar and put it into a cup of tea. The tea will turn black, because the tannin in the tea unites with the iron and makes ink. People who take iron as a medicine, should not drink tea for some hours after.

CLOTHING

To show that thin woolen is the safest to wear next the skin.

1. Lay pieces of thin woolen cloth, cotton cloth, and linen cloth, of equal size, upon a little water on a piece of glass or stone, and let them remain until the whole of each piece is wet. Notice carefully which takes up the water first. Then wave each piece in the air the same number of times, and see which dries first. The woolen will absorb the water readily and will dry slowly.

To show how the thickness of cover and drying of water from the surface cool the skin, etc., beneath.

2. Take a few fresh cucumbers or tomatoes and put them under a piece of woolen blanket, well soaked in cold water with a little ammonia in it, and lay all in the sun. The thickness of the cloth and rapid drying (evaporation) of the water will keep the tomatoes or cucumbers almost cold, although lying in the sun's rays. Wet leaves in one's straw hat, act in the same way.

To show that black clothing is hotter than white.

3. Take a burning-glass and hold it over a perfectly clear white piece of paper. It will hardly take fire, and only after a long time. Take a lead pencil and make a little spot in the middle of the paper and hold the burning-glass over it. In a very short time it will begin to smoke and burn, and soon be in flames. Black attracts the sun's rays as white does not.

APPENDIX A

PREVENTABLE CONTAGIOUS AND INFECTIOUS (CLIMATIC) DISEASES.

The causes which make disease have been so long at work and are everywhere so active that it has become no small part of hygiene to prevent and limit certain diseases, especially those which are called contagious or infectious, and such as are found chiefly in hot countries.

Contagious diseases (from the Latin word *contagio*, to touch) are such as one person may receive or "take" from another (or from some animal) ill of any of them, either directly by touch or indirectly by the use of the same articles, by the breath, etc.

Infectious diseases are such as are caused, *not* by the effect of one person or animal upon another, but by common or general effects of climate, soil, dampness, or other widespread conditions, upon those exposed to them.

Some diseases — like smallpox — are both contagious and infectious (both these words and the diseases to which they belong are very often confused); others — like glanders and those which come from the poisons of plants, etc. — are contagious only; while others — like cholera and yellow fever — appear to be infectious.

The causes of many infectious diseases may be carried several miles by air, water, or insects to persons who are well; and some diseases — like malignant pustule, farcy, malaria, and yellow fever — seem to be carried from animals or other sources to man by the bites of mosquitoes or other insects.

We can *at once* surely prevent by special means some of the very worst of these diseases, and some we can very much lessen and limit, if we cannot wholly prevent them. Others we must reach and control by slower and more general means.

It is *proved* by great experience, that what we call Vaccination, properly done, will certainly prevent most persons from having smallpox if exposed to it, and will in all cases lighten and limit the disease if taken. The use of *quinine* (the bark of the cinchona tree) protects many persons from having malaria, even though much exposed to malarial surroundings. The free use of certain vegetables — like potatoes and onions — or of lime-juice, we know will prevent persons from having the disease called scurvy, which usually follows the use of much salt food. Thorough boiling will certainly destroy all worms and their eggs and the seeds of disease which sometimes get into our food and drink.

While we often do not know just what causes a disease, or how it comes to us, we often do know when it is coming or has come near us, and what we can do to stop its march, and also how to control and lessen its hurtfulness.

Some of the diseases common in tropical regions which are at once more or less preventable or controllable, and the means that we can use to prevent their spread among us, are given in the following list: —

NAME OF DISEASE.	MEANS OF PREVENTION OR CONTROL.
SMALLPOX (*Variola*).	Vaccination in infancy and every ten years afterward till fifty. Shut up (isolate) all cases of the disease away from people. Disinfect the persons, clothing, and surroundings of those who have it and of those exposed.
DIPHTHERIA.	Have clean soil and pure air and water. Shut up (isolate) all persons, who have it or have been exposed. Disinfect their clothing and the places where they have been. Boil all water used. See that milk used is pure.

TYPHOID FEVER (*Enteric fever*).	Have only pure soil and water. Be sure that milk is pure. Boil all water and milk. Disinfect all surroundings of those sick, especially the waste of their bowels. Keep the sick away from others.
TYPHUS FEVER (" *Ship-fever* ").	Same preventive means as for Typhoid.
CONSUMPTION (*Tuberculosis*).	Live only in pure, dry air, and in the open air as much as possible. Rest and live well. Keep clean and warm. Have good habits. Destroy all spittle of those sick with the disease. Have them sleep away from others. Disinfect their surroundings. Burn all rags, etc., used by them.
SCARLET FEVER (*Scarlatina*).	Keep those sick of the disease away from others. Disinfect fully the person and all clothing and surroundings. Oil the sick person's skin to prevent scales flying about. Keep soil, air, and water clean. Be very careful that the milk used is pure. Boil it.
ERYSIPELAS.	Keep any person sick with it by himself. Keep air, soil, water, and clothing clean. Disinfect the person of any patient, and his clothing and surroundings. Boil all water. See that the milk used is pure. Keep all flies and insects away from the patient or the infected room. Keep all open wounds, cuts, etc., of those exposed dressed with antiseptics.
LEPROSY (*Lepræ Veræ*).	Keep all those affected away from others. Disinfect persons affected, clothing and surroundings. Live in open air. Keep clean. Avoid infected persons or places.

MOCK LEPROSY (*Elephantiasis*).	Keep all persons affected away from others. Disinfect them and their surroundings. Keep mosquitoes from those sick with the disease. Keep clean, bathe often, and avoid those affected. Destroy mosquitoes.
MEASLES (*Rubeola*).	Those sick of the disease should be kept by themselves. Disinfect them, their clothing and surroundings. Avoid affected persons or places. Live well. Use only good air and water and pure milk.
CHICKEN POX (*Varicella*).	Same as for measles.
WHOOPING COUGH (*Pertussis*).	Same as for chicken pox and measles.
OPHTHALMIA, ETC. (Very bad diseases of the eyes).	Great care should be taken to destroy, by burning, everything coming from the diseased eyes. Great cleanliness must be had, and care in avoiding the use of things used by those affected. Cleanse often with hot water.
MALIGNANT PUSTULE (*Charbon*).	All affected animals must be promptly killed and the flesh burned at once. Disinfect all places where disease has been. Protect carefully against flies likely to carry the disease. Live well.
CARBUNCLE (*Anthrax*).	Avoid all doubtful meat. Disinfect the person and premises. Kill any animal affected and destroy flesh.
GLANDERS AND FARCY.	Kill all affected animals as soon as disease appears. Disinfect fully all places where they have been. Destroy the flesh thoroughly. Avoid all sick animals or their surroundings.

HYDROPHOBIA (*Rabies*).	All rabid animals should be killed as soon as disease first shows itself. Their bodies should be well disinfected and burned. Avoid any thing or place used by such.
ITCH (*Scabies*), LICE, AND OTHER SKIN DISEASES.	Keep clean. Use hot baths. Bake all suspected clothing. Disinfect the person, clothing, bedding, etc., with a weak solution of formaline or expose to burning sulphur.
Trichinæ Spiralis. TAPEWORMS (*Teniæ*). LICE, FLEAS, ETC. ANÆMIA.	Keep the soil and water clean. Use only boiled water. Boil or bake all doubtful meats, especially pork. Disinfect soil about houses with carbolic acid or bichloride of mercury. Keep away dogs, cats, monkeys, etc.
WASHWOMAN'S ITCH (*Dhobi Itch*).	Thoroughly bake all articles from the laundry or disinfect with formaline or expose to burning sulphur. Allow clothes to be washed only in very hot water and with soap.
YELLOW FEVER.	Keep everything about the house, soil, and water *clean*, *dry*, and pure. Use only boiled water. Disinfect well all places and things used by those sick of the disease. Drain pools and swampy places near by, or cover them with coal oil to destroy mosquitoes and their eggs. Protect against mosquitoes by nettings. Be careful to use only good milk, fruit, etc. Keep mosquitoes away from patients. Kill all mosquitoes by formaldehyde gas or the smoke of pyrethrum powder.
ASIATIC CHOLERA.	Avoid all places or persons sick with the disease. Move into another place if you can.

	Keep air, soil, and water pure. Keep all places very clean and dry. Use disinfectants freely. Isolate all those sick and disinfect their persons, clothings, waste, and surroundings thoroughly with chlorine, formaline, or burning sulphur. Limewash walls and ceilings. Use only boiled water, well-cooked food, and keep warm and dry. Burn all clothing, etc., used by the sick who die.
Dysentery, etc.	Keep the soil about the house dry and clean. Use only boiled water. Cook food well. Eat no unripe or decayed food of any kind. Be sure the milk is pure, and that the meats are sweet and good. Separate those sick of the disease from others. Disinfect well all waste, etc., of those sick with the disease. Flannel bands should be worn about the body.
Bubonic Plague (*Pestilentia*).	Rats must all be killed. The soil and air must be dry and clean. Use only boiled water. Disinfect everything about the house, and disinfect or burn all clothing, etc., used by those sick of the disease. Use all the means named with Asiatic cholera. Keep patients by themselves.
Lockjaw (*Tetanus*).	Disinfect soil about the house and drain it. It should be planted and ploughed for several years, to get the poison out of it. Keep the air and water pure. Use only boiled water. Keep clean. Live well. If lockjaw has been known in the place, cover all open cuts and hurts with antiseptic dressing. Keep flies and other insects out of house by nettings.

Beri-Beri (*Beriberia*).	As this disease appears in tropical countries chiefly, the same care and means should be used as in yellow fever, bubonic plague, etc.
Malaria (*Intermittent Fever*).	The soil should be drained and kept clean. Pools and swampy places about the houses should be covered with oil, as with yellow fever, to prevent and kill mosquitoes and their eggs. The house should be protected from insects by nettings, screens, etc. Quinine or cinchona bark should be taken to ward off the fever. Take food and drink coffee, especially in the morning.
Dengue.	The same means should be used as for malaria.
Rheumatism.	The soil should be dry. Cold and damp air must be kept out of the houses. Light flannel underwear should be worn by those who have had the disease, and all should sleep in dry, warm places, away from drafts of air. Little sugar should be eaten.
Scurvy (*Scorbutus*).	As this is a disease caused by salt food, there should be fruit, vegetables, and vegetable acids as part of one's food.
Goitre.	This disease is generally caused by "hard" water, i. e., water with too much lime or magnesia in it. Using "soft" water (rain water), or water free from such minerals, is the best preventive. Boiling the water used will help.
Gastritis and other Forms of Indigestion.	Will be avoided by care in one's food and drink, by eating slowly, and by the use of charcoal (after eating) in small quantity.

NETTLE RASH (*Urticaria*). Being caused by irritation of the stomach, and so of the nerves, by something eaten, like shell-fish, cheese, acid berries, etc., each one can be free from it by not eating the things that are known to be hurtful.

SUNSTROKE (*Solus ictus*). As this occurs often in hot, moist climates and is preventable, it is here named. Keep out of the sun. Keep the head properly covered.

APPENDIX B

1. TO KEEP FOOD FROM SPOILING QUICKLY.

To keep most kinds of food fresh and sweet as long as possible, we must keep it *cool*, *dry*, and *away from dust*, *insects*, *germs* (bacteria), *etc.* Bread, cake, etc., should be kept from becoming so moist as to mould, or from drying too fast and becoming hard, and so should be kept in tin boxes, wrapped in several thicknesses of cotton cloth.

As the chief means of keeping things cold (ice, freezing mixtures, ice machines, cold storage, refrigerators, etc.) are only to be had by few, and in the country not at all, we need think only of the simpler means of cooling food.

Cold springs of water or running streams which can easily be carried through channels of wood or stone work under small houses built over them are not very common in hot countries, but wherever they are to be had can be made of great use for cooling and keeping food.

Some of the simpler kinds of whirling devices for evaporating moisture (by spinning round and round) from water jars, etc., have long been in use in tropical climates. By means of steel springs which can be wound up like a clock, by small windmills, water-wheels, etc., the use and value of these whirling devices for cooling water and other articles of food and drink may be very much increased. There is no good reason why, by means of a proper spring or wind or water wheel and a proper netting-covered jar, cool, pure liquids should not always be had almost anywhere in hot countries. By the use of fans, or small, light "blowers," the same methods can be made to send constant streams of cool air through meat-safes, fruit-boxes, etc.

Protection against dirt, insects and their eggs, germs (*bacteria*), etc., is one of the most important means of keeping food fresh and sweet. Meats and fish must be kept from flies and their eggs, which soon breed worms, etc., and from moulds and ferments, which quickly cause sourness and decay. Good fine nettings of wire, cotton, or grass will do more than almost anything else to prevent rapid changes in food, especially meats, milk, butter, cheese, bread, etc. The cotton netting can easily be made antiseptic — that is, free from germs.

TO KEEP MEATS, ETC.

All animals killed for food should be well bled, and their flesh should be well cooled before being marketed. Meats and fish should be trimmed and scraped. All dirt, bruised parts, and blood should be carefully removed, and the flesh be lightly sprinkled with clean salt. Unsalted fish can be kept but a few hours at most, and the sooner they are cleaned and eaten after being taken from the water the better. Meat carefully wrapped in one or more thicknesses of cotton cloth well wet in salt water, and put away in as dry and cool a place as can be had, will usually keep sweet a day or two. Meat may be kept for some days by simply heating the outside very strongly or by covering the surface with powdered charcoal. The application of a pretty good layer of sugar to the surface of meat will help to keep it for a little time. Covering the whole surface with powdered charcoal is perhaps as good a method as any except cooking. The best way to keep flesh of all kinds after it has been well cleaned and cooled, is to cook it by boiling, baking, or roasting, and, then to put it away in a cool, dry place, wrapped as mentioned and protected by antiseptic netting.

Sometimes meats, fish, etc., well wrapped in tightly sealed wrappings, or put into tightly covered tin boxes or pails, can be put under the water of running streams and kept in good condition for a few days, even in very hot weather. A deep well or cool spring into which such foods can be lowered in tightly covered pails, is a great aid in keeping them fresh and sound.

Powdered borax (*sodae boratis*) sprinkled over meat will help to keep it fresh for a short time. Preservative fluids of different kinds, being chiefly of some form of borax, salicylic acid, etc., for sprinkling upon or putting into meat, have been invented; some of these seem to have merit, but most are not fitted for common use.

Some kinds of meat and fish can be effectively preserved for some time by drying in the sun, "curing" by smoke or sugar, or "pickling" in strong vinegar or salt brine; but these methods are not very good for hot climates, except with sun-dried or "jerked" beef, or other meat, of which in some parts great quantities are used.

TO KEEP VEGETABLES.

Vegetables to be kept fresh and sound should be thoroughly washed, cleaned of all dirt, and wiped dry. They should be kept in as cool and dry a place as can be had until a short time before they are to be used, when they should be thrown into cold water for a little while. They must never be kept so damp or dirty as to rot, nor so dry as to wilt and wither. Potatoes, cucumbers, lettuce, radishes, and other vegetables are much improved in freshness and crispness by being allowed to remain some time in cold water just before being eaten.

TO KEEP MILK, BUTTER, ETC.

Milk should be thoroughly cooled as soon as drawn from the cow, either by letting it stand where cool air can pass over it, or by being set into cold water. It should be put only into perfectly clean cans or bottles, which should be well washed in very hot water whenever empty; they should be left open as much as possible to the air, but covered with fine antiseptic netting to keep out injurious germs, etc. Milk should always be kept as cool and as still as possible (except as churned for butter, etc.). Butter should be kept cool in tightly covered earthen jars or cans, away from all dust, germs, taints, etc. Cheese should be kept dry and cool in tightly covered tin cans, away from moulds and dirt. Eggs can be kept fresh and good for some time by being well covered with salt, lime, or grease.

TO KEEP FRUITS.

Fruits should be kept dry and cool, and handled as little as possible. A cool draft of air blowing upon them from a fan or punkah helps to keep them in good condition. All decaying fruit should be frequently separated from the rest, and it will aid in keeping fruit, especially the sweeter kinds, to protect it with fine netting from dirt, insects, bees, wasps, etc. It is well to keep most fruit in dark but airy places, but it must never be shut up and allowed to grow moist in boxes or other close places.

A good, cool, dry, well-ventilated but dark cellar, that can have at times sunlight and air freely let into it, is a great convenience in keeping most kinds of fruit, vegetables, and eggs, and even meat, milk, and butter, if well-protected by cloth and gauze wrappings and made secure from rats and other vermin.

2. FOODS THAT SHOULD BE COOKED.

Meats and soups.
Vegetables (most).
Cereals. Wheat flour, corn-meal, oatmeal, etc., etc.
Fish and some shell-fish.
Peas, beans, macaroni, etc.
Eggs, and some fruits.
Sauces, confections, etc.
Tea, coffee, chocolate, etc.

3. FOODS THAT DO NOT NEED COOKING.

Dried and salted meat and fish.
Some vegetables (tomatoes, lettuce, radishes, etc.).
Some shell-fish (oysters, mussels, etc.).
Milk, eggs, butter, cheese.
Some mixed foods (salads, mayonnaises, etc.).
Fruits and nuts.
Some canes and water-plants (sugar cane, cresses, etc.).
Pickles, etc.
Some sauces.
Wine.

4. FOODS EASY TO DIGEST.

Soups (except rich ones).
Milk (when fresh).
Oysters (raw or steamed).
Eggs (raw or slightly cooked).
Tripe (broiled).
Fish (in all ways).
Poultry (if not too old).
Bread and cereals (if properly cooked and not too new).
Lamb and mutton.
Goat's flesh.
Game and wild animals generally.
Beef and horse-beef.
Some kinds of cheese.
Most vegetables.
Most fruits.
Some confections, honey, etc.

5. FOODS NOT EASILY DIGESTED.

Heavy, rich soups.
Sour milk.
Lobsters, shrimp, crawfish, etc.
Eggs (if hard boiled, fried, etc.).
Some poultry (peafowl, geese, etc.).
Corn and rye bread, etc.
Veal and "jerked" meats.
Pork and bacon.
Some game or wild meat.
All "salt-cured" food.
All "pickled" food.
Some vegetables (cabbages, turnips, etc.).
Some kinds of cheese.
Some confections.
Nuts, raisins, etc.

APPENDIX C

INSECTICIDES, DISINFECTANTS, AND DEODORANTS

1. INSECTICIDES, ETC.

For Mosquitoes.	Coal oil on pools, still water, etc. Sulphur, pyrethrum powder smoke. Mosquito nettings for doors, windows, beds, etc.
For Fleas.	Columbian powder. Formaline. Carbolic acid. Fresh air. Dalmatian powder. Cleanliness.
For Lice.	Dry heat. Carbolic soap, Formaline. Sulphur fumes for body lice. Soap and hot water, Formaline, carbolic acid for the head. Formaline, carbolic acid, and Columbian powder for beds, bunks, etc.
For Bed-bugs.	Corrosive sublimate. Very hot water. Carbolic soap. Intense dry heat. Lime wash.
For Water-bugs and Roaches.	Columbian powder. Borax. Hot water and carbolic soap. Dry air and cleanliness.
For Ants.	Columbian powder. Coal oil. Carbolic acid. Lime wash.
For Flies.	Nettings. Screens. Fans. Punkahs. Dalmatian powder. Fly-paper. Formaline. Fly-traps.
For Ticks, Chigoes, etc.	Cleanliness. Frequent hot baths. Carbolic soap. Chloroform. Formaline.
For Screw-worms, Maggots, etc.	Chloroform. Pulv. Peruvian bark (*cinchona*). Coal oil. Hot water.

Rats in tropical countries can only be effectively exterminated by ferrets, poison (arsenic), etc., and the latter can only be used with caution. Mice are best destroyed by cats and traps.

2. DISINFECTANTS.

Among the more effective germ-destroyers which can usually be had in tropical countries are the following: —

Ashes (*dry*).	To cover filth of all kinds.
Bi-chloride of Mercury.	In solutions of varying strength for almost every kind of bacteria.
Borax (*sodæ boratis*).	For some moulds and ferments.
Bromo-choralum.	An odorless general disinfectant of low power.
Carbolic Acid.	In solutions of different strength an invaluable general disinfectant, though not destructive of some bacteria except in very strong solution or crystals. For smallpox most useful and efficient.
Carbonic Acid Gas.	A very destructive agent for some of the lower forms of life.
Charcoal.	For the antiseptic preservation of meats and the purification of air and water an unrivalled agent.
Chloride of Lime.	For the destruction of all germs from decaying organic matter an efficient agent. Useful wherever a crude, cheap disinfectant is wanted and its vile odor is not objectionable.
Coal Oil.	For destroying mosquitoes or their eggs in stagnant pools, etc., the best agent known, especially when cost counts, and useful for brushing over surfaces where larvæ of insects, etc., are suspected.

Corrosive Sublimate.	A preparation of mercury which has no equal for bedbugs in furniture, walls, floors, etc. Rather expensive and calling for great care in its use, for it is a *poison.*
Dry Earth.	The cheapest disinfectant for all manner of organic filth. Its effectiveness is in proportion to its dryness.
Dry Heat and Steam.	For infected bed-clothing, vermin in clothes, etc., which will take no harm from very high temperatures, moist or dry, no more effective disinfectant exists.
Fire.	For glandered or rabid animals, some forms of poisonous plants, etc., actual combustion seems the only safe disinfectant.
Formaldehyde Gas.	When it can be had without too much effort, the best agent for house disinfection after contagious and infectious diseases. Not yet in common, everyday use, but much used by health officers.
Formaline (Solutions of).	Used in solutions of differing strength for the different purposes of a disinfectant, it has few equals. It is equally good to destroy body lice by very weak solution, or germs of all kinds by stronger ones. It is reliable and to be had almost everywhere.
Hot Water.	For the destruction of the larvæ of bedbugs and other insects, of moulds and ferments and the promotion of general cleanliness, it is of the first value.
Lime (calcium) and Lime-wash.	For any purpose where destruction of insect life and larvæ, small moulds, and fungi, by means of a caustic disinfectant and subsequent cleanliness of surface is called for, lime and limewash are most effective,

especially on old wooden and stone walls, in poultry houses, etc.

Sulphurous Acid Gas. For a thorough, reliably destructive disinfectant where the air can be confined, the fumes of burning sulphur have few rivals. It injures metals, gilding, etc., and unless care is used may cause fires. As a disinfectant after contagious and infectious diseases in houses it is sure, but inconvenient.

Sulphuric Acid. Used in solution according to its needs as to strength, sulphuric acid (the vitriol of commerce) is a powerful disinfectant of all germs from organic matter (filth) and can be used with care in many places. It destroys metals by its fumes alone, and should not be used near them.

3. DEODORANTS.

Deodorants are such things as destroy unpleasant and unhealthy odors either by destroying their cause or by creating more agreeable or less dangerous ones in their places. Some disinfectants are also deodorants, but many deodorants have no disinfecting power.

Burnt coffee.

Burnt sugar.

Bromo-chloralum.

Carbolic acid solutions.

Smoke of balsamic woods, turpentine, etc.

Lime-wash and chloride of lime — although the latter is not an agreeable odor — are all deodorants, as they destroy an odor or change it for one less hurtful or offensive.

APPENDIX D

Quick Helps to School Hurts, etc.

Many small accidents and injuries of one kind or another often happen among children at school, and need only a little care or help at the time. Others more serious, need more attention until the doctor can be found to give further care and skill.

It is well that every teacher should know and teach the children, and that the children should learn so as to use in their homes, the simple ways and means of caring for any of the smaller hurts which may happen among them.

Even simple fractures of the arm or leg may be made more comfortable and less likely to take more harm, by the use of simple splints and slings until a doctor can attend to them.

Every school building should be supplied with a tin basin, tin pail, small tin pan, a one dollar oil stove (hand), and a can of coal oil, matches, a few tin spoons, a small pitcher, a few cups, several soft sponges, a lot of old handkerchiefs, soft cotton and linen rags, a few roller bandages of different sizes, two or three pairs of good strong tweezers (one long pair), a pair of sharp scissors, a sharp knife with a large and a small (pointed) blade, a package of sticking plaster, a roll of surgeons' plaster, a jar of vaseline, plenty of common cooking soda (bi-carbonate of soda, *not* "baking-powder"), a bottle of collodion and several small camel's-hair brushes, a piece of alum, a hank of strong carpet-thread, a few towels and some castile or "ivory" soap, a flask of sweet oil, a bottle of lime-water, a bottle of linseed oil, a bottle of bay rum, a bottle of (household) ammonia, a bottle of ammonia salts, a small, tightly-stoppered bottle of chloroform (kept locked up), a bottle of paregoric, a few surgical needles, a skein of saddler's silk and a bit of white wax, a tin (tightly covered) box of flax-seed meal, a bit of lunar caustic, a few palm-leaf fans, a few pieces of stiff pasteboard or cigar-box covers, a bottle of malted milk and another of beef extract. With these almost every simple hurt can be properly attended to or made more comfortable till the doctor comes.

A few simple directions for the care of the most common hurts among school children are here given. Some of them will furnish all the care that will be needed; others will only relieve and protect till better skill can be had. In all severe cases, or where the teacher is in any doubt, a doctor should be sent for, if one is to be had. The accidents, etc., are given in the order of the alphabet. The remedies suggested are the simplest, or those most likely to be at hand in the tropics.

Abrasions, hurts where the skin is knocked or rubbed off, should be washed carefully with cold water, be covered with a little vaseline or collodion, and be bandaged with a soft bandage to protect the raw surface and keep out air and dirt.

Burns, if small and slight, are best cared for by letting cold water run on them freely, or by plunging the burnt part into cold water until the heat is drawn out and the pain lessens; or by wrapping the part in a linen cloth soaked in a strong solution of common soda (bi-carbonate), which will soon relieve the pain. Burns which cover a large surface, especially about the head, although not deep, are the most dangerous. Deep burns, if small, are not usually very dangerous. Cover all large burned surfaces with carron oil (equal parts of lime-water and linseed oil, usually to be had), which keeps out the air and lessens the pain. Wrap all small burned parts well in cotton, covered thick with oil or vaseline. This makes a false skin and keeps out air.

Bites of Animals. Dogs, cats, and other animals often bite children. Unless the animal is mad (rabid), the bite need not be serious. It is wise, however, to take all precautions. The wounds should be washed clean with hot water. Make the wounds a little larger with a sharp knife and let them bleed. The edges may also be touched with the lunar caustic (nitrate of silver) and the doctor should be sent for.

CONTUSIONS, or bruises, should be carefully sponged clean (in warm water if possible). All torn or crushed parts should be gently and carefully put into their places and a bandage be smoothly and firmly, but not too tightly, put around the whole. Sometimes the parts will need to be held in place by strips of surgeons' plaster (which can be warmed and made to stick if dry and hard, by laying it in the sun or by rubbing the back of the strips quickly over a hot lamp-chimney).

CUTS should be washed clean in cold water, unless small and clean, when it is sometimes well to bind them up in the blood, which glues the parts together, forms a crust over the cut, and permits it to heal at once. If the cut is large or deep, the edges should be brought as near together as possible and held with strips of plaster, and a pad of linen or cotton cloth wet in cold water should be bound over it. If the blood is dark and flows steadily, it is from the veins and is usually quickly stopped by pressure and bandaging; but if it is bright red and comes in jets, it is from the arteries and may need a surgeon's help. If the cut is in the arm or leg, if the limb is raised and bent at the elbow or knee it will help to check the bleeding. A thick pad bound firmly over the cut is usually the best means to stop the flow of blood.

CLOTHING ON FIRE. The clothing of children sometimes gets on fire by accident. In every such case throw a woolen wrap around the one whose clothing is ablaze, rubbing and brushing out the fire as much as possible. Don't wait for water, but lay the child quickly on the floor or ground and roll him over and over to smother the fire. Keep the flames away from the child's mouth and nose, as to breathe the flame is very dangerous.

Ear-ache, a very common and painful trouble of school children, is best cared for by putting hot poultices or woolen cloths wrung out in hot water on the ear and about the neck. A few drops of paregoric (camphorated tincture of opium) on a bit of cotton stuffed into the aching ear will often stop the pain.

Fainting, in children, calls first for plenty of fresh air. Lay the child flat on her back. Loosen the clothing about the neck and body. Fan her, sprinkle water in the face, and put smelling salts (ammonia) to the nose. Rub the hands, arms, wrists, and feet. Do not crowd around or pour anything into the mouth while the child is unconscious. It may choke it.

Fits occur occasionally among school children, epileptic most commonly with boys, hysterical with girls. In an epileptic fit, where there are convulsions, frothing at the mouth, the eyes are open and do not close on being touched, the tongue is being bitten, etc., lay the child on the floor, loosen the clothing, give plenty of air, and put a thin piece of soft wood or a small roller bandage between the back teeth to save the tongue from being bitten. Send for a doctor. In a hysterical fit, where there is sobbing, moaning, or wild and silly laughing, mild convulsions, and seeming unconsciousness, give air freely, loosen the clothing, dash cold water in the face, and firmly and sternly command the patient to obey you, as she needs your help to control herself. Hysterical persons should be removed from the school. Their example is bad, and likely to spread.

Foreign Matters in Eyes, Ears, Nose, or Throat are very common annoyances of teachers and troubles of pupils, especially of the younger ones. Specks of dust or stray eyelashes often get under the eyelids and hurt very much. Beans, peas, cherry and other fruit stones are often pushed so far into the ears or nose that the child cannot get them out; while a cherry or tamarind stone, a marble or lead pencil, held in the mouth, is sometimes sucked into the windpipe and endangers the child's life.

If a speck of dust or an eyelash gets into an *Eye* and causes distress, several ways can be tried to get it out. Draw the upper lid outward and downward over the lower lid, and while holding it there have the child blow hard through the nostril on the same side, keeping the other tightly closed. This may remove the cause of the trouble. Or the child may hold the inflamed eye wide open in a basin of clean warm water. This will sometimes wash out the dust. But best and surest: take a small round pencil or match and lay it so as to press gently lengthwise of the eyelid just above the ball of the eye. At the same time, telling the child to look down at its feet, take hold of the edge of the lid by the eyelashes and turn it up backward over the small pencil so that the inside of the lid can be plainly seen. Hold the turned lid in this way till its surface and that of the eyeball have been examined. Usually whatever is making the trouble is soon found and easily removed by a light, quick touch of a handkerchief. Cover the eye and let it rest, or if very sore, bathe it a few times in quite warm water. It will soon be well.

If a bean or pea gets into a child's *Ear* or *Nose* so far that he cannot get it out, he often gets frightened. Quiet the child, and try gently to remove the troublesome thing with the tweezers or a loop of fine wire. If in the nose, closing the open nostril and blowing into the child's mouth a hard quick puff will throw the bean or pea out of the other. Do not try to syringe any such thing out of the ear, as it will make it swell and cause more pain. If the troublesome article cannot be easily removed, send the child to the surgeon.

If a cherry stone, marble, or like object gets sucked into the throat and is causing suffocation, the child should be rapped smartly on the back, the head being thrown forward. If this does not give relief, the teacher should thrust the finger well back into the throat and try to remove the obstruction, putting a wad of cloth between the back teeth to prevent being bitten. If this does not succeed, the finger is very likely to cause vomiting, which may dislodge the cause of the trouble. Send for the doctor instantly (unless the child is immediately relieved), directing the messenger to tell him why he is sent for.

LIGHTNING occasionally strikes one or more children during a tempest. Any one receiving such a stroke should at once have cold water poured over him by bucketfuls (taking care not to smother him), and should then be rubbed hard with warm woolen cloths. As soon as signs of life are seen the child should be rolled in warm blankets and be put to bed, and stimulants and concentrated food be given it in small quantities. Sleep and quiet will do the rest.

NEEDLES, SPLINTERS, FISH-HOOKS, etc., often get buried in the flesh. All but the last can usually be quickly removed by picking or cutting them out with a sharp clean knife or large strong needle, and a pair of tweezers. A fish-hook is best removed by forcing the barb through the flesh so that it shall come through on the outside, then filing the wire of the hook in two and drawing out the pieces separately.

NOSE-BLEED frequently happens. It can usually be stopped by holding the head well up and applying cold water, or by plugging the bleeding nostril with a bit of cloth or cotton soaked in alum water. A piece of cold iron or stone laid on the back of the neck will sometimes help to stop the bleeding. A very good way is to press the finger firmly against the bottom and side of the nose, and so press upon the blood-vessel which supplies the bleeding nostril.

POISONS IN THE STOMACH, OR OF THE SKIN, are not uncommon among school children. In most cases of stomach poisoning the first effort must be to empty the stomach. Large quantities of warm water (with or without mustard) may be given for the purpose without harm, as may other simple emetics. Milk, charcoal (which seems to absorb many poisons, like opium, strychnine, and arsenic), sweet oil, etc., are helpful with nearly all poisons. The doctor should be sent for at once.

Plants that poison those who touch them are found in all countries, and school-children are very often made ill by them. A strong solution of salt or of sugar of lead in water is a good general remedy, easily had everywhere, and if freely used on the burning surface of the inflamed skin as soon as the eruption appears, will do much to comfort the child till better remedies can be had.

SNAKE BITES are common in most parts of the tropics, Porto Rico alone being practically free from venomous snakes. All snake bites should be at once thoroughly washed, and the child should suck the wounds for some time. Whiskey or brandy may be given quite freely. A cord may be tied tightly above the wound (if an arm or leg is bitten), and the bites may be seared with caustic. A doctor should be called at once if possible.

STINGS OF INSECTS (wasps, bees, spiders, etc.) are every-day happenings. They may mostly be made comfortable by thoroughly washing the bites, sucking out the poison, and bathing with very warm water or covering the part with soft, thick mud. Bathing the bites in a strong solution of common soda (bicarbonate of soda) will give much relief. If the parts swell much, frequent bathing with hot water will lessen the swelling and soreness.

SPRAINS are common hurts, and are sometimes severe. They should be freely bathed in hot or cold water, which it is well to pour upon the tender part from a pitcher held high. The sprained part should be bandaged and kept wet with rum and water, and allowed to rest.

SUNSTROKE sometimes happens among children in the tropics. Any one overcome by heat or sunstroke should at once, without being moved far, be laid in a cool and airy place, which should be darkened, and should be kept quiet. Very cold water (ice if it is to be had) should be freely applied to the head, especially at the back of the head and the neck. The head should be raised a little and all tight clothing removed. If the skin is hot, it should be freely sponged with rum (or vinegar) and water. If convulsions occur, the patient may inhale a very little chloroform. If the heart beats are feeble and the pulse is low, stimulants or concentrated food may be given in very small quantities. Send for the doctor at once.

TICKS, CHIGOES ("Jiggers"), etc., under the flesh, and especially in the feet of children who go barefoot in hot countries, are very common, and give much trouble. As they burrow under the skin and their heads are arrow-shaped, they are not easily picked out. If they are not removed, however, very severe sores often follow. They should be taken out with a sharp-pointed knife or strong needle and tweezers as soon as found, and the sores should be well washed with water and a little chloroform. They should be dressed with vaseline and covered with surgeon's plaster. After the sore begins to heal it may be covered with collodion.

TOOTHACHE may sometimes be relieved by hot applications or by a few drops of paregoric or laudanum (*tincture of opium*) on a bit of cotton put into the aching tooth.

WOUNDS OF RUSTY NAILS, COPPER TACKS, THORNS, etc., are not uncommon, especially in the hands and feet. If any parts of the rusty nail, etc., remain in the wound, they should be taken out with the fine point of a sharp knife and the tweezers. Cleanse the wound carefully by washing (with warm water if it can be had). Let the child suck the wound clean, and it will do no harm to let it bleed a little. If the wound is large or very sore, put on a warm soft poultice of flaxseed meal for a few hours. Cover the wound with a bit of cloth coated with vaseline and later with surgeon's plaster or collodion.

ACKNOWLEDGMENTS

THE author's acknowledgments are hereby made and his appreciative thanks are returned for the courtesies shown him in the preparation of the illustrations for this little book: to the Standard Oil Company of New York for cuts of oil stoves; to the American Waltham Watch Company, for the representation of the works of a watch; to the Horlick's Food Company of Racine, Wis., for the illustration showing the reparative use of food; to the Lalance & Grosjean Mfg. Company of New York, manufacturers of steel and agate ware, for the cut depicting "Two ways of broiling;" the Standard Sanitary Mfg. Company of Pittsburg, for the illustration of "A good bath room;" to Lortz & Co. of Utica, N. Y., for the cut of a mosquito-proof, metal cot; to the Dover Stamping & Mfg. Company of Cambridge, Mass., for the cut of a sanitary metal ash can; to Hall & Ruckel, druggists, of New York, for the cut showing perfect teeth; to N. A. Knapp of Rochester, O., for the picture of a ferret; to the Procter-Gamble Company of Cincinnati, for the "tail-piece" showing proper wash-tub conveniences; and to Dr. L. L. Gilman, late Asst. Surgeon U. S. Army, and to Charles H. Ames, Esq. for the loan of photographs.

A. A.

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